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**THE U.S. NUCLEAR DETERRENT:
WHAT ARE THE REQUIREMENTS
FOR A STRONG DETERRENT IN AN
ERA OF DEFENSE SEQUESTER?**

HEARING

BEFORE THE

SUBCOMMITTEE ON STRATEGIC FORCES

OF THE

COMMITTEE ON ARMED SERVICES
HOUSE OF REPRESENTATIVES

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THE U.S. NUCLEAR DETERRENT: WHAT ARE THE REQUIREMENTS FOR A STRONG DETERRENT IN AN ERA OF DEFENSE SEQUESTER?

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ARMED SERVICES,
SUBCOMMITTEE ON STRATEGIC FORCES,
Washington, DC, Tuesday, March 19, 2013.

The subcommittee met, pursuant to call, at 4:09 p.m., in room 2212, Rayburn House Office Building, Hon. Mike Rogers (chairman of the subcommittee) presiding.

OPENING STATEMENT OF HON. MIKE ROGERS, A REPRESENTATIVE FROM ALABAMA, CHAIRMAN, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. ROGERS. The House Armed Services Committee's Subcommittee on Strategic Forces will come to order. This rescheduled hearing has been delayed a week, but I do appreciate the patience of our panelists for the storm that didn't happen, but we tried.

It is on an important topic, "The U.S. Nuclear Deterrent: What Are the Requirements for a Strong Deterrent in an Era of Defense Sequester?" And we have a distinguished group of experts to help us consider the subject. They are Dr. Keith Payne, Professor and Head, Graduate Department of Defense and Strategic Studies, Missouri State University; Dr. Andrew Krepinevich—did I say that correctly—President, Center for Strategic Budgetary Assessments; and Dr. Bruce Blair, Co-founder of Global Zero.

This Nation has some key decisions ahead of it. We find ourselves in the position of having to recapitalize our entire deterrent at exactly the time that every other nation is growing or modernizing its nuclear forces, but we have absorbed reductions in our defense budget of \$487 billion and we are now 18 days into President Obama's defense sequester that will take another half-trillion dollars out of our defense budget over the next decade.

Our nuclear deterrent is the most cost-effective and proven means of promoting peace for the American people and their allies, but we have not been investing in it in a responsible way. Our real and potential adversaries and competitors understand this. Russia, for instance, has tested three new ICBMs [intercontinental ballistic missiles] during the New START [Strategic Arms Reduction Treaty] Treaty entered into force 2 years ago. The People's Republic of China is preparing to put to sea a ballistic missile submarine and sea-launched ballistic missile and it appears to be readying three new long-range ballistic missiles capable of attacking the United States. I note that Russia's Vladimir Putin tells his people that, "nuclear weapons remain the main guarantee of Russia's sov-

ereignty and its territorial integrity. It plays a key role in maintaining global and regional stability and balance.”

President Obama, however, says in the State of the Union Address last week or last month that, “we will engage Russia to seek further reductions in our nuclear arsenals ... because our ability to influence others depends on our willingness to lead.”

Are they both right? I think General Welch, former Strategic Air Command commander and former Chief of Staff of the U.S. Air Force, had it right when he said, “the only basis for the idea that drastically reducing the number of nukes we had would magically make us safer and help eliminate other nuclear weapons is hope, but hope is not a plan and hope is not a basis for security. Hope does not defend us. Leading the world to zero nuclear weapons is at best a fairy tale.”

There is a rising consensus from General Scowcroft, Secretaries Perry, Schlesinger, Shultz, and Senator Nunn that the one-time frenzy of a world without nuclear weapons is little more than a fantasy, and a dangerous one at that. For example, the so-called Gang of 4’s recent *Wall Street Journal* piece is a dramatic shift from the original 2007 piece. This is welcome. We are at a crisis point where we must focus on eminent threats from North Korea and Iran.

So, I look forward to examining these matters today. They are important to the Nation’s security and they are important matters as we will tackle in our markup of the Fiscal Year 2014 National Defense Authorization, and with that, I yield to my friend and colleague from Tennessee, Mr. Cooper, for any opening statement that he may have.

[The prepared statement of Mr. Rogers can be found in the Appendix on page 31.]

STATEMENT OF HON. JIM COOPER, A REPRESENTATIVE FROM TENNESSEE, RANKING MEMBER, SUBCOMMITTEE ON STRATEGIC FORCES

Mr. COOPER. Thank you, Mr. Chairman, and thank the distinguished witnesses. What we have here today is like a battle of the Ph.D.s, so I look forward to the different testimonies.

Mr. Chairman, I, too, saw the article in the *Wall Street Journal* from Secretary Shultz, Secretary Perry, Foreign Secretary Kissinger, and Former Senator Sam Nunn, and I had a little more positive interpretation of it. First of all, I saw four very distinguished Americans who were agreeing on a bipartisan basis that we should at least look at reductions, and these, granted, need to be done in a balanced and responsible way, but I thought overall they were very bullish on the prospect that we could lead the world to a better place, and I look forward to hearing the expert testimony of the witnesses on this subject.

Mr. Chairman, with your consent, I would like to insert my statement for the record as well as the testimony of General Cartwright, who is unable to be with us today.

[The prepared statement of Mr. Cooper can be found in the Appendix on page 34.]

[The prepared statement of General Cartwright can be found in the Appendix on page 111.]

Mr. ROGERS. Without objection, so ordered.

Other members of the committee are advised that they can offer their opening statement for the record, and with that, we will go to Dr. Keith Payne for his opening statement that will be summarized in five minutes. Dr. Payne.

**STATEMENT OF DR. KEITH B. PAYNE, PROFESSOR AND HEAD,
GRADUATE DEPARTMENT OF DEFENSE AND STRATEGIC
STUDIES, MISSOURI STATE UNIVERSITY**

Dr. PAYNE. Thank you, Chairman Rodgers and Ranking Member Cooper. It is a pleasure and honor to be here. I need to start out by saying I am speaking as an individual and not for any of the institutions with which I am associated.

Let me start by noting that there are numerous proposals for deep U.S. nuclear reductions. They typically are based on an approach to deterrence known as minimum deterrence, and the basic contemporary argument is that a small number of U.S. nuclear weapons is adequate for deterrence because nuclear threats from China and Russia no longer are plausible and because nuclear weapons are irrelevant to the priority threat we face; that is, nuclear terrorism.

Consequently, so the argument goes, the U.S. can, with little or no risk, undertake deep nuclear reductions that will reduce nuclear dangers, advance U.S. nonproliferation goals, and save many billions of dollars.

My examination of these and other minimum deterrence claims suggests that they are dubious at best. For example, the claim that nuclear deterrence is irrelevant to terrorism is false. Terrorists can be deterred in some circumstances, including by deterring their state sponsors, and nuclear deterrence certainly may help in that regard.

In addition, the promise of substantial savings from nuclear reductions is again false. In fact, the minimum deterrence recommendation that the U.S. deter with conventional forces in place of nuclear would likely require a net increase in spending.

Similarly, the claim that U.S. nuclear weapons are of little relevance to U.S. relations with Russia and China misses the facts that Russia and China both point to us as enemy number one, make explicit threats against close U.S. allies and emphasize the great military and political value that they place on nuclear weapons. They are not following our antinuclear lead.

It also is impossible to claim with any credibility that deterrence will work reliably at low nuclear force levels, nor that U.S. conventional threats can substitute reliably for nuclear weapons. No one knows if the first of these claims is true, and all evidence suggests the second claim is false.

Further, deep U.S. nuclear reductions would encourage some of our allies to go nuclear themselves. While emphasizing our advanced conventional forces leads some opponents to emphasize more the great need that they see for nuclear weapons. Consequently, my conclusion is that minimum deterrence is likely to promote nuclear proliferation coming and going. And the claim that nuclear reductions will reduce the prospect for nuclear accidents is contrary to the abundant available evidence, over five decades, that

there is no historic correlation between the number of weapons and the number of accidents.

Finally, deep U.S. nuclear reductions would degrade those U.S. force characteristics likely to be most important for deterrence. Those characteristics are the force flexibility, diversity, and resilience.

The ability of our force to adapt as necessary for deterrence across many plausible scenarios and surprising threats depends on their flexibility and their diversity. Moving to a much reduced nuclear arsenal that degrades those qualities is precisely the wrong way to go for deterrence.

In short, the deep reductions recommended by minimum deterrence would not likely lead to the promised benefits but instead would degrade our capability to adapt our deterrence to new and future threats, encourage some opponents towards nuclear arms buildups and to challenge our deterrence strategies and encourage some allies to acquire their own nuclear deterrence and thereby potentially inspire a possible cascade of nuclear proliferation.

The same evidence that demonstrates the serious flaws of minimum deterrence suggests three contemporary and I believe more realistic guidelines. One, U.S. nuclear forces must be of sufficient size and diversity to provide the flexibility and resilience necessary for deterrence across a wide and shifting array of threats. Two, this flexibility and diversity and resilience of U.S. forces is threatened as the nuclear arsenal becomes ever smaller. Along these lines, former STRATCOM [U.S. Strategic Command] Commander General Chilton said in 2010 that to preserve flexibility, we should not move below the 1,550 deployed warhead ceiling of the New START Treaty. And three, assuring our allies is as important as deterring our foes and depends again on our possession of the diverse and flexible nuclear capabilities that many allies deem necessary for their assurance.

Let me conclude by noting that my emphasis on the need for a U.S. nuclear arsenal that is large enough and diverse enough to provide flexibility and resilience is completely consistent with the conclusions of the bipartisan Congressional Strategic Posture Commission that was headed by Dr. Perry and Dr. Schlesinger, a commission that was created with help of the House Armed Services Committee.

Thank you.

[The prepared statement of Dr. Payne can be found in the Appendix on page 35.]

Mr. ROGERS. Thank you.

Dr. Krepinevich.

STATEMENT OF DR. ANDREW F. KREPINEVICH, JR., PRESIDENT, CENTER FOR STRATEGIC AND BUDGETARY ASSESSMENTS

Dr. KREPINEVICH. Chairman Rogers, Ranking Member Cooper, members of the subcommittee, thank you for the opportunity to testify here today on the subject of U.S. nuclear requirements. First, let me applaud the subcommittee. This issue, to me, is extremely important. The U.S. nuclear arsenal is a strategic asset of the United States. It has been a strategic asset for nearly 70 years

now, and any decision to make major changes in the size or composition of that arsenal merits thorough consideration and study.

From my perspective, the requirements in terms of looking at reductions to the arsenal, they should be examined in terms of our security objectives, which I view as two overarching objectives. One is to prevent the use of nuclear weapons in general, and specifically, against ourselves and our allies and partners, and also to prevent the use of nuclear weapons as instruments of coercion, sometimes referred to as nuclear blackmail.

And second, in the event that this fails and that nuclear weapons are used, to terminate the use of such weapons as quickly as possible in a manner that best serves U.S. interests.

Now, both the Obama administration and a number of experts, as you have mentioned, have made the point that these objectives can best be achieved by significant reductions beyond those to which we are committed in the New START Treaty. Based on the analysis I have seen, my belief is that this assertion is open to question, and my testimony examines two overriding questions with respect to this issue. First, I am skeptical that a reduction in U.S. nuclear forces will lead other nuclear powers to reduce their arsenals or aspiring nuclear powers to forego acquiring nuclear weapons, and I would cite four observations.

First, so far, there hasn't been a phenomenon of follow-the-leader. Both United States and Russia dramatically reduced their nuclear arsenals since the end of the Cold War, and as Dr. Payne pointed out, many nuclear powers are modernizing and/or expanding their nuclear arsenals.

Second, to the extent that we reduce our nuclear forces, the issue of extended deterrence or the nuclear umbrella comes into question, which is to say to what extent can allies and partners rely on a diminishing U.S. nuclear arsenal to provide the kind of protection in terms of deterrence and also protection against coercion?

Third, we, as my colleagues have pointed out, have an enormous advantage in conventional forces, something we didn't have during the Cold War, and of course we took the lead in the 1950s and relied on nuclear weapons to help offset that conventional inferiority. Well, now, others are following the leader in a different way. We have the Russians and the Pakistanis, in particular, increasing their emphasis, increasing their reliance on nuclear forces, not just for deterrence but for warfighting purposes as well.

And finally, the problem of unintended consequences. You know, there is a question that, you know, at what point in terms of force reductions do we go, and the issue is, do we at some point encourage others to follow us and is that a good thing, or do we encourage others to build up to our level and create a more complicated situation than the one we have right now.

The second issue is, is would a reduction in U.S. nuclear forces discourage the use of nuclear weapons, and I cite an observation by a former French Foreign Minister, Hubert Védérine, who says the country that possesses the bomb does not use it and automatically enters the system of deterrence and doesn't take absurd risks.

I have four observations with respect to this issue, which is to say a reduction in U.S. nuclear forces would discourage the use of nuclear weapons.

As I mentioned first, other countries see a use in nuclear weapons beyond deterrence, and specifically, the cases are Russia and Pakistan, which have integrated nuclear use into their doctrines.

Second, not all decisionmakers who control nuclear weapons are, I think, what we would consider to be rational or necessarily rational, and in my testimony I cite a number of instances ranging from Adolf Hitler to Saddam Hussein, Fidel Casto, Nikita Khrushchev, where their behavior would not quite equate to what I think we would consider to be mature, rational behavior that was not prone to taking absurd risks.

Third, there is the issue of structural instability, and I will just briefly mention here, the point that there are some areas in proliferation where even if both sides desire to avoid nuclear use, they risk, quite frankly, a very unstable situation, crisis and stability, and finally, an end-player competition. The lower we go to the extent that we bring others along with us, we have a competition among many states, and in that situation, we have to rethink the dynamics given that during the Cold War we had a two-state competition.

So, very briefly, it seems to me that while there is general agreement on the basic security objectives that we ought to be pursuing, the devil is in the details, and there is a great divergence of opinion as to how best to achieve these objectives, and what I see is a remarkable lack of thinking about prospective real-world situations. A lot of abstract thinking, very little real-world thinking, what I would call thinking that is associated with what the Defense Department would call it an assessment, and it is this kind of thinking, I think, that is really needed before we take big steps in terms of altering the size and structure of our nuclear forces.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Krepinevich can be found in the Appendix on page 49.]

Mr. ROGERS. Thank you, Dr. Krepinevich.

Dr. Blair is recognized 5 minutes to summarize his opening statement.

STATEMENT OF DR. BRUCE G. BLAIR, PRESIDENT, WORLD SECURITY INSTITUTE

Dr. BLAIR. Thank you, Congressman Rogers and Congressman Cooper, and other distinguished members, for inviting me here today. I am very honored and pleased to testify before you.

My bottom line judgment is that continuing U.S. nuclear reductions would produce substantial benefits and carry no risks.

The Global Zero Commission report issued last year by General Cartwright and others, including Senator Hagel, recommended a force of 900 total nuclear weapons, an 80-percent reduction from the current stockpile, and assessed that force to be more than adequate to meet strategic requirements. As General Cartwright put it, "this would not be a small nor humble force designed for minimal deterrence. It would hold at risk all of the major categories of facilities in all countries considered to pose a potential WMD [Weapon of Mass Destruction] threat to the United States."

Nine hundred total weapons is not a small arsenal. Sometimes we lose perspective on these things. Nine hundred weapons possess

enormous destructive power, far more than necessary to impress any potential rational foe. For the irrational foes, such as fanatical terrorists, the level of American nuclear armaments would make little or no difference at all.

So why are these deep cuts possible and what are the benefits? First and foremost, obviously, the Cold War ended 20 years ago. The requirements of deterrence are obviously much lower between countries that are no longer enemies and that no longer believe either side intends to attack the other.

The decline of mutual threat in our primary relationship over the last 25 years has enabled our two countries to achieve unprecedented levels of cooperation and mutual benefits in a multitude of areas, including cutting their nuclear stockpiles by 75 percent since the end of the Cold War, but these legacy arsenals remain still very large and there is ample room for further cuts.

Second, reducing the nuclear stockpiles feeds on itself in a positive way. As both sides reduce their nuclear arms, nuclear-related targets go away along with the need to hold them at risk, so this is a dynamic that has resulted in massive reductions in weapons and targets and greatly undercut the rationale for new weapons.

Gentlemen, we have literally reversed the arms race.

Third, smart targeting has made further nuclear possible cuts without sacrificing any coverage. I will give you just one example. Not very long ago, our nuclear targeteers were planning to lay down 10 weapons on one very high value command and control target, command post. Today, they have, as a result of an intelligence breakthrough, managed to figure out how to target that facility with two weapons.

As it was noted, we also have conventional superiority that has reduced our reliance on nuclear weapons. They have given us useable options, much more useable than nuclear weapons, increasing our credibility in dealing with threats that previously required a nuclear response and created yet more room for further reductions.

Fourth, this conventional rebalancing has really strengthened the credibility of our extended deterrence to allies such as South Korea. Remember, South Korea, up until the 1980s, needed help from U.S. tactical nuclear weapons to deal with the North's artillery threat. Today, South Korea has conventional superiority over the North, and the need for U.S. nukes for warfighting on the Peninsula has essentially gone by the boards.

The North's fledgling threat has, of course, revised somewhat the need to wave our nuclear umbrella over the allies, but don't forget, we just possess overwhelming nuclear superiority over the North, and even after deep cuts, that will remain.

Fifth, the continuing reduction presents opportunities for reconfiguring our strategic forces and our posture in ways that really strengthen stability. Let me give you an example. A key benefit is that cyber warfare threats, which are growing, can be mitigated as a result. By eliminating forces that have to be maintained on once ready alert, like the Minuteman [LGM-30 intercontinental ballistic missile] forces, and by eliminating our reliance on launch on warning to protect those forces, we can completely eliminate the danger that exists today that unauthorized actors could trigger a launch

that was not intended or block the execution of a legitimate launch ordered from the President.

Six, continuing reductions, even deep cuts, are not expected to stimulate China or other countries to rush to parity. That is, I think, the prevailing assessment of the intelligence community. In the case of China, General Kehler recently testified that, "I do not see, nor has the intelligence community reported to me that China is seeking to have some kind of numeric parity with the United States or with Russia."

Of course, you know, an effort to rush to parity is possible, though very unlikely. In such an event, it would be easily detectable, would take many years, and we could adjust accordingly.

It would be extremely beneficial if continuing reductions in the U.S. and Russian nuclear arsenals bring China and the other nuclear weapons countries to the negotiating table. That is an important goal for this country. A multilateral negotiations must be initiated soon to address the multitude of nuclear dangers that exist outside the U.S.-Russia relation in places like South Asia.

Seventh, and I am coming to the end here, continuing U.S. nuclear arms reductions would affirm the U.S. support for the Non-Proliferation Treaty, which continues to be, in my view, an indispensable tool in the international community's effort to prevent and roll back proliferation.

The days of U.S. and Russian lip service to the disarmament clause of the treaty are over if they hope to preserve and strengthen this treaty in the face of growing proliferation pressures around the world.

Mr. ROGERS. Dr. Blair, you need to wind it down. You have gone about 2 minutes over.

Dr. BLAIR. Okay. Thank you. I just have one paragraph.

Last, this hearing seeks to set priorities for the U.S. program under sequestration. I would argue that the size of the U.S.—that we have plenty of time and margin here, that the size of the U.S. arsenal and scale of its reduction or modernization are less important than the operational postures today of the forces and the cohesion of the system of command and control.

My first priority would be to ensure a full-scale, thorough review of cyber security of all nuclear networks to identify and remove cyber warfare threats that could compromise the integrity of these networks, that is my first priority. It is essential not to sacrifice this on the altar of sequestration.

And lastly, my second priority under sequestration would be to secure and dispose of excess surplus, weapons-grade nuclear materials around the world.

Thank you.

[The prepared statement of Dr. Blair can be found in the Appendix on page 69.]

Mr. ROGERS. Thank you, Dr. Blair.

We now turn to questions. Each member will be allowed 5 minutes, and I will start with the questions myself.

Dr. Blair, you just made reference to General Kehler's testimony in which he said that China was not, based on his exposure to intelligence, "rushing" to parity with the United States. Would you

acknowledge that China is expending a larger percentage of their GDP in missile system technology than we are?

Dr. BLAIR. I don't know.

Mr. ROGERS. Would you acknowledge that their volume of tactical regional weapons far exceeds our capacity?

Dr. BLAIR. Yes—

Mr. ROGERS. China's.

Dr. BLAIR [continuing]. I would dispute that. I think the total size of the Chinese arsenal is in the range of—there is a debate on this, I think, but the debate is whether the total arsenal is—

Mr. ROGERS. How about Russia's?

Dr. BLAIR [continuing]. Low hundreds or mid hundreds.

Mr. ROGERS. How about Russia's?

Dr. BLAIR. 150. So we have 700 tactical nuclear weapons. China has far fewer than that.

Mr. ROGERS. What about Russia's?

Dr. BLAIR. Russia probably has on the range of 1,500 to 2,000—

Mr. ROGERS. Compared to ours.

Dr. BLAIR [continuing]. Deployed tactical nuclear weapons compared to our 700. We have a comparable advantage in reserve strategic weapons.

Mr. ROGERS. Would you agree that Russia is spending a larger percent of their GDP on missile system technology than we are, capability?

Dr. BLAIR. I would question that.

Mr. ROGERS. The answer is "yes." The answer is "yes" on China and answer is "yes" on Russia.

Dr. BLAIR. I still would question that. I would have to go back and study that. Let me make a point about that. The United States spends more on intelligence alone every year than the entire Russian defense budget.

Mr. ROGERS. My point in talking about the percentage of GDP spent on missile capability—

Dr. BLAIR. But, sir—

Mr. ROGERS [continuing]. Is certainly an indicator of their intent and their seriousness about the technology.

Dr. BLAIR. I don't think that is very good indication.

Mr. ROGERS. Dr. Blair, your report that you made reference in your testimony, you say, was based on considerable detailed analysis. Would you make this detailed analysis available to this committee?

Dr. BLAIR. Sorry, detailed analysis of?

Mr. ROGERS. For your report that you referenced in your testimony. You say it is based on considerable detailed analysis. Would you make that analysis available to this committee?

Dr. BLAIR. I think the report itself, which is 22 pages long, is fairly detailed.

Mr. ROGERS. So that is the analysis you are making reference to. You say in the report itself it is based on analysis. I would assume that means a body of evidence.

Dr. BLAIR. The report is based on analysis and the deliberation of a distinguished group of authors, including former head of strategic command, including Senator Hagel now Secretary of Defense.

Mr. ROGERS. The reason why I am asking is because when I look at your report, about half the footnotes are footnotes referencing your own writings. Why is that?

Dr. BLAIR. Because I have done the most analytical and scholarly work in this area.

Mr. ROGERS. Are there other experts that you relied on?

Dr. BLAIR. Well, those footnotes refer to many, many other experts' analyses.

Mr. ROGERS. That supported your views, the other experts?

Dr. BLAIR. Some do, some don't.

Mr. ROGERS. Okay. Dr. Blair, general officers from the current Commander of STRATCOM, General Kehler, to the former Commander of STRATCOM, General Kevin Chilton, Lieutenant General Kowalski to retired Major General Chambers and many others who are recently part of the senior leadership of the Department of Defense have rejected Global Zero's recommendations, and I will insert a staff paper into the record on that point without objection.

[The information referred to can be found in the Appendix on page 126.]

Mr. ROGERS. What do you know about the subject matter that these general officers don't know?

Dr. BLAIR. I think the argument stands on its face, Congressman. You can read through it. I just gave my testimony. If you find that the logic and the arguments and the points don't stand up to your scrutiny or anyone else's, I am happy to have that debate, but I made the case for why, and General Cartwright and others subscribe to this, why a 900-nuclear-weapons force is not a small minimal deterrent force.

Mr. ROGERS. Dr. Payne, would you care to comment as to why you believe those commanding generals differ with the findings of the report?

Dr. PAYNE. Well, because I believe that they are in consensus that they need to protect the flexibility, the resilience, the adaptability of the nuclear arsenal, and going down to very low numbers, such as is recommended in that report, has a number of casualties, but one of the casualties of going down to very low numbers tends to be exactly the flexibility and the resilience of the U.S. nuclear arsenal. And even if one can claim rightly that the U.S. nuclear arsenal can deter today at some set number, even if you grant that, the question is whether you can deter next year, the year after that, and 10 years from now. And the need for flexibility and resilience in the arsenal comes exactly from that. We need to be able to deter over the next two decades, and those characteristics of the arsenal are directly related to its size and its diversity. So I believe that the commanders of STRATCOM are interested in preserving the diversity of the U.S. arsenal so that we can safeguard our ability to deter war.

Mr. ROGERS. Dr. Krepinevich, do you care to comment as to why those commanding generals would differ with their findings of the report?

Dr. KREPINEVICH. Well, Mr. Chairman, I don't know why they would. On the other hand, I would like to think that perhaps their logic included considerations along the lines of it is probably a lot easier to reduce the size of nuclear forces than to build them back

up again. I think there will be a real prejudice against that, particularly given our financial situation right now and the fact that it is not likely to be resolved anytime soon.

Second, as Dr. Payne said, I think you have to look long-term. We don't make changes in our nuclear arsenal overnight, and when you are thinking about what kind of a nuclear force you need, 5 or 10 years out into the future is not a long way to look.

And I would say the third has to do with what kind of contingencies do we see our nuclear forces being brought to bear, and we are so far away from the Cold War, and you know, during the Cold War, we eventually got to the point where it was us and the Soviets and it was Armageddon, and you know, once it started, there wasn't, you know, much sense thinking about a world after or a day after.

Now, I think you can look at a range of plausible contingencies, and certainly that's been my experience in talking with senior military leaders and senior officials both in this Administration and the last administration. There is a—there are a range of contingencies, and it is not Armageddon, it is not us and the Russians, and until you think through those contingencies and until you think through the fact that, as Dr. Blair, I think, pointed out in his study, there is some—I wouldn't go as far as he would, but there is some potential substitutability of precision conventional weapons and cyber weapons for targets that we used to reserve for nuclear weapons. Missile defenses are much more capable now than they were a generation ago.

We have things like directed energy where remarkable progress is being made, and until you really think through those contingencies and look at the dynamics, the steady state dynamics, the crisis dynamics, and even the warfighting dynamics, because there can be conflicts between other countries, think India-Pakistan, God forbid, Israel and Iran, where we would have to look at that as a third party and try and determine how to keep maybe a crisis from getting out of control, and if it does, how to stop the bleeding, and also, quite frankly, what the world looks like the day after.

So, I would like to think, having talked most recently to General Kehler about these kinds of scenarios, that, you know, that is where the effort is right now, and if so, then I applaud it.

Mr. ROGERS. Thank you very much. The Chair now recognizes the ranking member for any questions he may have.

Mr. COOPER. Thank you, Mr. Chairman. I know that this subcommittee, as currently constituted, is in its early days, but I am somewhat disappointed in the adversarial tone that I heard in your comments so far in this hearing. I hope this is not an indication of forthcoming behavior because I know we are both from the same region, we know what good manners are like, and all of these witnesses have been kind enough to come, some on short notice, and there was a rescheduling involved as well, so I hope that we can approach these vitally important national issues with an air of civility and calm as we approach some very serious decisions here.

I am curious because I think this Global Zero cause has been misnamed. It sounds like it should have been called like Global 900, and the cause on the other side should perhaps be called, I don't know, what Global 30,000 or Global 20,000 or Global 10,000,

you know, some much larger number. The number we are at right now, given the curious counting rule, seems to be 1,550, and surely no one thinks that is a perfect number.

So, as Dr. Krepinevich just mentioned with the advances in conventional, cyber and missile defense technologies, we need to continually revise the effectiveness of what arsenal we have, and he also noted, I thought quite wisely, that whatever arsenal we have, maybe we should pay for. So, our adversaries are not unaware of that defense sequestration or inability to pay for even the recent wars in Iraq and Afghanistan.

So, I think a comprehensive and calm look at this would indicate that let's figure out whether 900 or 1,000 or 1,100 or some number like that is an appropriate number. And it is a little bit awkward to have these hearings in an open setting, but I am kind of curious, I thought Dr. Blair gave an excellent list of possible uses for the weapons we have got, and I would like to ask Dr. Payne and Dr. Krepinevich which targets, in addition to those that Dr. Blair mentioned, are essential to be targeted and unable to be targeted with an arsenal of 900 weapons.

Dr. Payne, do you want to go first?

Dr. PAYNE. Yeah, let me start off by saying that the counter or the opposite poll of 900 weapons certainly doesn't need to be 10,000 or 30,000.

Mr. COOPER. Well, what number do you propose?

Dr. PAYNE. Well, when I was in the Pentagon, the range that we reached, following a good bit of analysis, was 1,700–2,200, which became the basis for the Moscow treaty.

Mr. COOPER. Was there any opposition to that reduction when you made that recommendation?

Dr. PAYNE. It became a formal treaty and received——

Mr. COOPER. But there was some opposition to it.

Dr. PAYNE. The opposition was not great, let's put it that way. So that the distinction between those who are favorable towards nuclear zero and those who are skeptical isn't the difference between 900 weapons and 10- or 30,000 weapons.

Mr. COOPER. Why don't we call it Nuclear 900 at least during my questioning?

Dr. PAYNE. Yes, sir. And let me also add that General Chilton in 2010 gave a number that he said he would be more comfortable with to preserve flexibility of the U.S. arsenal and that was 1,550, so those are the ranges that folks are talking about at this point, sir.

And then you asked the question about what kind of capability might the United States need for deterrence purposes.

Mr. COOPER. I said what additional targets.

Dr. PAYNE. Yeah. Well, in a sense, the answer to that question is, it depends on what kind of threat is necessary to deter opponents, and those kind of threats, that kind of information can change over time. Harold Brown, back during the Cold War, said the kind of capabilities we need to deter the Soviet Union happened to be political leadership, military capabilities. Those included very deeply buried targets. So the kind of weapons that were necessary to threaten in those days had to be able to threaten those kind of targets. In the future there may be any number of

different types of targets that need to be threatened for deterrence purposes.

Mr. COOPER. Dr. Krepinevich, do you have a more specific answer?

Dr. KREPINEVICH. I am not a nuclear targeteer, Congressman, but what I would say, and I think this is where Dr. Blair has been trying to help, is I am reminded of a quote from a British admiral, Jackie Fisher, who once said a lot of folks want to know how big the British Navy ought to be and what kind of ships we ought to have in it. He said the first thing you have to do is make up your mind how you are going to fight. He said, how many of us have made up our mind how we are going to fight? And then he said, how many of us even have minds? So he was being pretty sarcastic at the moment. But the point here is how are you going to deter, and if deterrence fails, how are you going to fight?

And Dr. Payne points out that deterrence lies in the eye of the beholder, so on the one hand you have to—and we devoted an enormous amount of effort and thinking during the Cold War to understanding how the Soviet leadership calculated cost and benefit and risk. In fact, Kissinger in the late '60s and early '70s, when he was the NSC [National Security Council] advisor, the thing that he was most interested in getting from the intelligence community were the psychological profiles of the Soviet leadership. So that is point number one.

And do we, you know, do we have that understanding, and you know, if you have the understanding of China in 2009, well, there is a new leadership in today, and as we know from our own leadership, you know, every leader is different, so have we a good understanding of how other nuclear powers calculate cost, benefit, and risk so we have a good idea of what is required to deter them, first.

Second, if you look at Dr. Blair's report and the targeting list, again, I would be interested to know is that the target list for March 2013, because if we look at China, for example, China may have 100 nuclear weapons, they may have 500. The former commander of the Russian Strategic Rocket Forces, General Yesin, says he thinks they have 750 but maybe over 1,000. So how confident are we that we know how many targets there are in China that we need to hold at risk, and how easy is it to hold a Chinese mobile missile launcher at risk? We played that game at close range in the first Gulf War and didn't have much success, so there is that issue.

There is the issue of breakout. We used to worry a lot about breakout during the Cold War, which is why the SALT [Strategic Arms Limitation Talks] treaties limited launchers because we knew we couldn't count the warheads. Well, the Chinese have not only a lot of launchers but a lot of missiles that now carry—or are armed with conventional warheads. Do we worry about whether they can swap those out in place of nuclear warheads and in effect what during the Cold War we describe as breakout?

So, again, I really do think, you know, it is a case of really sitting down and trying to think through the problem in a very careful way, given the stakes that are involved, not only in terms of security, but as you point out, Congressman, in terms of resources that are increasingly scarce before we decide, even within a ballpark fig-

ure, you know, what kind of nuclear posture we want and of course what kind of risk we are willing to take that is associated with that posture.

Mr. COOPER. My time is limited. The chairman has already been very indulgent, but Dr. Kissinger said, I think, that even paranoids sometimes have real enemies, but he just joint-authored this article which said that Washington—this is a quote, “Washington should carefully examine going below New START levels of warheads and launchers.” So that sounds like an indication that we should carefully examine this issue. The perfect number isn’t determined yet, but here is Dr. Kissinger on record with George Shultz saying we should seriously consider this, so that is what this subcommittee is trying to do, and I think the more specific answers we can get on targeting and capabilities the better.

Thank you, Mr. Chairman. I appreciate your indulgence.

Mr. ROGERS. I thank the gentleman. Gentleman, Mr. Nugent, is recognized for 5 minutes for any questions he may have.

Mr. NUGENT. Thank you, Mr. Chairman. I appreciate it. I thank the panel for being here. It is always good to hear divergent ideas. It is not a bad thing for all of us. But to Dr. Blair, I know that you mentioned in your report, particularly as it relates to Senator Hagel, then-Senator Hagel, and in particular with regards to the presidential directives negotiated in another round of bilateral arms reduction talks were implemented unilaterally, and Secretary of Defense, then Senator Hagel stated during his confirmation hearing, “I don’t agree with any recommendation that would unilaterally take any action to further reduce our nuclear warheads and our capability. Every option we must look at, a reaction we must take to reduce warheads or anything should be bilateral and should be verifiable and negotiated.”

Do you agree with that?

Dr. BLAIR. I do, and as a matter of fact, the analysis that we went through, which by the way, involved Tom Pickering, who was ambassador to Russia who knows a fair amount about the Russian leadership and the scene in Russia, that analysis proceeded on the assumption that we really needed to tighten up our treaty process to include all nuclear weapons so that some of these unknowns that are floating out there, tactical weapons owned by China or by Russia that have completely escaped previous regulation are now put in the basket, negotiated, verified, and monitored. You know, all these dramatic reductions that we have achieved since Ronald Reagan started the process in the 1980s have dropped from 70,000 weapons between us and the Soviets, down to about 16,000 between us today, have all been—the vast bulk of those reductions have been achieved unilaterally. There has never been any arms control agreement that has regulated the total stockpile of weapons in any country.

Mr. NUGENT. If I could—

Dr. BLAIR. So these dramatic reductions have been based on unilateralism. What we are trying to do in this report is say let’s put all the weapons into a basket—

Mr. NUGENT. Well, if I could claim my time.

Dr. BLAIR [continuing]. And all the rest, and negotiate their reductions and closely verify and monitor them.

Mr. NUGENT. That is the key, verification. Are we in fact verifying our last treaty with Russia?

Dr. BLAIR. Of course.

Mr. NUGENT. There has been no slip on verification.

Dr. BLAIR. The last testimony I heard from authorities in this area, including General Kehler and Rose Gottemoeller who negotiated the treaty have been that there have not been—there have been intensive verification and no—and no significant lapses—

Mr. NUGENT. You cite presidential nuclear initiatives several times as an example of how further reductions and actions like de-alerting could be affected or effectuated, but you know, Russia is not in compliance with those initiatives. So, if they are not in compliance, are they cheating?

Dr. BLAIR. Are you telling me that they are cheating on the New START agreement?

Mr. NUGENT. I am asking you are they cheating.

Dr. BLAIR. You have more access to the authoritative answer to that question than I do.

Mr. NUGENT. Well, I would like to direct that—if you don't have an answer, I would like to direct that to Dr. Payne.

Dr. BLAIR. As I said, recent testimony by authorities said no, they have not.

Mr. NUGENT. Dr. Payne.

Dr. PAYNE. Yes, sir. The Russians, by their own statements, are in violation of the presidential nuclear initiatives of 1990 and 1991, which includes continued Blackjack [Tupolev Tu-160 strategic bomber] production which is in violation of the PNI [Presidential Nuclear Initiatives]. It includes retained battlefield nuclear weapons, atomic demolition mines in violation, it includes deployment of their Iskander [NATO designation SS-26 Stone] missile as a nuclear capable weapon by Russian statements, includes nuclear artillery by Russian statements, it includes routine deployment of nuclear weapons on naval ships other than SSBNs [ballistic missile submarines]. These are all open Russian statements claiming that they are in fact doing this. These are all violations of the PNI. So when I hear this is a model of how we should go in the future, I think, you know, maybe we ought to fix this one first before we decide to take this up as a model in the future.

Mr. NUGENT. And I think verification, obviously, is—and Dr. Blair, you agree that verification is the important component in all this, no matter what you agree to, if we can't verify and—

Dr. BLAIR. The Global Zero report did not recommend following the route of PNI.

Mr. NUGENT. By Dr. Payne's testimony and by Russia's own admissions in regards to what they have and what they have in their stockpile, they are clearly not in compliance.

Dr. BLAIR. I thought you were asking about compliance with New START.

Mr. NUGENT. I am sorry that I am out of time and I yield back.

Mr. ROGERS. I thank the gentleman yielding back, and the Chair now recognizes Mr. Garamendi for 5 minutes for any questions he may have.

Mr. GARAMENDI. Let's finish this last conversation. It seems as though the discussion between Mr. Blair and Mr. Payne, were deal-

ing with two different treaties and understandings, so let's get a clarification here.

Dr. BLAIR. That is correct.

Mr. GARAMENDI. Dr. Payne, you were talking about a 1990, 1991. Could you quickly explain that?

Dr. PAYNE. Yes, sir. I was talking about the PNI agreements of 1990 and 1991.

Mr. GARAMENDI. Well, maybe somebody will be listening to the rest of this conversation then. And Dr. Blair, you were talking about?

Dr. BLAIR. The New START Treaty.

Mr. GARAMENDI. Okay. So, I think we pretty much know what New START is, so let's talk about what the 1990, 1991 and why it is relevant to the question that was asked.

Dr. PAYNE. Sure. The PNI, as I recall, were intended to be reciprocal agreements between the United States and Russia to draw down nonstrategic nuclear forces. It wasn't a treaty. It didn't have a verification package, but it was an attempt to, essentially, provide those kind of reductions outside of a negotiated treaty with a verification package, and so given the fact that that is an approach that is talked about a good bit today, I think it is useful to go back and look at the PNIs and see how the Russians now are doing with regard to compliance to that, and what we know now by the Russians' own statements in their own press, they are in fairly substantial violation of it.

Mr. GARAMENDI. The PNI were agreements, mutual agreements between the United States and Russia?

Dr. PAYNE. These are political agreements between the United States and Russia, correct, sir.

Dr. BLAIR. They were tacit agreements. They were not stipulated in any kind of written agreement between the two countries.

Mr. GARAMENDI. I think we need to be really, really careful because this kind of a discussion gets out there and used for an argument, but its relevancy to the formal treaty structures is somewhat removed.

Now, there may have been an understanding, but I will guarantee you that what was said here is going to find its way outside the door, and bingo, the Russians are not in compliance with treaties, when that is not the case at all. Is that correct, Mr. Payne?

Dr. PAYNE. Sir, the PNIs are outside of the formal ratified treaty process. That is correct, sir.

Mr. GARAMENDI. Thank you. Now, I would like to take this a little different direction. What kind of weapons do we need going forward? Do we need three different weapons? Do we need one different weapon? This is in part targeting but it is also targeting with what? Any one of you gentlemen want to talk about this?

Dr. BLAIR. Well, the Global Zero report developed an option that was based on a dyad of nuclear submarines and of B-2 [Spirit] bombers and made the case that there are serious liabilities with the current Minuteman nuclear force and that that was a force that could and should be closely examined for potential elimination. Reasons for that had to do with the lack of flexibility of the Minuteman forces, the fact that they have to fly over Russia and China to attack the current contemporary real adversaries of the

United States, such as North Korea; whereas, the flexibility of the submarines and the bombers were much greater in their ability to carry out a range of missions, nuclear missions.

So, we based the 900-warhead arsenal that I presented in my testimony on a dyad of submarines and B-2 bombers.

Mr. GARAMENDI. Okay. Comments.

Dr. PAYNE. Sure. My thoughts on that are the priority of maintaining a U.S. triad of nuclear forces.

Mr. GARAMENDI. Why?

Dr. PAYNE. Because the triad provides the United States enormous level of flexibility and resilience to deter threats in the future that we may not be able to identify now. It allows us to adapt to threats as they come along. That is the great brilliance of the triad, and if we are going to maintain a triad, then we need to look at what are the steps that need to be taken now.

Just for example, life extension program for the Minuteman missile, I think, is very important. Going ahead with a new bomber would strike me as very important to help maintain the triad so we don't move down to a dyad or a monad and then getting on—

Mr. GARAMENDI. Excuse me. I am almost out of time. In fact, I am out of time, but before you get to all of that, you have got to come back to the initial question of why a triad is necessary. You quickly blew through. You didn't have enough time to really get into it, but we really need in this committee, it seems to me, to really get down into the details of why or why not a triad. It is an enormous amount of money. The reconditioning of those, all three elements is extraordinarily expensive. Is it essential, and that is the subject matter.

I am out of time, and I thank you very much for your testimony.

Mr. ROGERS. Thank you, Mr. Garamendi.

The Chair now recognizes Mr. Franks for 5 minutes for any questions he may have.

Mr. FRANKS. Well, thank you, Mr. Chairman. Thank all of you for being here today. Dr. Blair, I will start with you. I was over in North Korea and South Korea here some time ago and I agreed with your premise that we have gained, at least South Korea has gained a qualitative advantage in conventional weapons. Did I understand your testimony that you had said something along the lines that now that that is gained, the nuclear deterrence or the nuclear capability on the part of South Korea or the United States supporting forces was no longer as necessary?

Dr. BLAIR. For tactical warfighting purposes we no longer have to rely on short tactical nuclear weapons to suppress the North Korea's artillery threat to the South. We do, obviously, want to continue to project a strategic threat at North Korea.

Mr. FRANKS. I wanted to make sure about that.

Dr. Krepinevich—I am sorry. Krepinevich. I got it right, didn't I, Krepinevich?

Dr. KREPINEVICH. Close. It is Krepinevich.

Mr. FRANKS. Krepinevich. Boy, I tell you, I know that never happens to you. I was impressed with your comments related to deterrent itself. It is in the minds of the beholder, and you know, it occurs to me that this discussion should always be predicated on how people perceive our deterrent.

I remember years ago that the discussion about a nuclear freeze or something along those lines, and William F. Buckley put it so well. He said, you know, the idea is not to freeze it, being able to only destroy each other a few times. The idea is to prevent someone from proceeding. And so I wanted to ask you, Dr. Blair, based on that, because I assume that you believe in deterrence in some of the comments you made, it sounds. Who would be more deterred? Who, as far as a potential enemy of the United States, Iran or China or anyone, who would be more deterred by our reduction in our strategic capability? Who would that deter more?

Dr. BLAIR. I don't think the reductions matters. It is what is left over at the end. Remember—

Mr. FRANKS. No. My question is, would there be anybody that would be deterred more by a reduction in our strategic capabilities?

Dr. BLAIR. If we have a 900—

Mr. FRANKS. Is that a "yes" or a "no."

Dr. BLAIR [continuing]. We have the ability—

Mr. FRANKS. I am going to move on then. Who would reduce their nuclear weapons based on us—I say put Russia aside for a moment. Who else would reduce their nuclear weapons arsenal or existing arsenals following our potential reduction?

Dr. BLAIR. Well, I don't think anyone would. I think we need to—

Mr. FRANKS. I think that is the right answer.

Dr. BLAIR. I think we need to assert leadership to bring other countries into the—

Mr. FRANKS. Is there a number too low, from your perspective, that we should go? In other words, what would be too low from your perspective?

Dr. BLAIR. We need to bring all the nuclear weapons countries into a negotiation.

Mr. FRANKS. All right. And if we did that, would there be a number too low?

Dr. BLAIR. The goal of Global Zero is through phased verifiable proportional reductions that in due course—

Mr. FRANKS. Hence Global Zero, I got you. All right. I just wanted to know where you were coming from.

Dr. BLAIR. And most people, I think, these days in the mainstream believe that the United States would be more secure living in a world without nuclear weapons than it is living in the world today.

Mr. FRANKS. Well, we might all feel more secure if we just lived on some distant fairyland planet, too. I mean, you know, the notion is unfortunately other people don't always do what we would like for them to do. It is a dangerous world.

Dr. BLAIR. In the 1980s, no one would have guessed that we would be—

Mr. FRANKS. Let me ask you another question. I am asking the questions here today, Dr. Blair.

Dr. BLAIR. Sorry?

Mr. FRANKS. I am asking you questions here today. I guess my question to you then—

Dr. BLAIR. I am trying to answer your question, sir. You are not giving me an opportunity.

Mr. FRANKS. All right. You have answered them so far. Given your conviction for steep nuclear reductions, would you then advocate significant increases in expenditures for conventional warfare, conventional weapons capability and missile defense?

Dr. BLAIR. Yes.

Mr. FRANKS. That's an answer.

Dr. Krepinevich, if you could suggest to us, as a committee, what is the one thing that we could do in our nuclear doctrine that would increase ultimately the safety and protection of American men, women, and children and posit the course, the pursuit of freedom in a safer capacity? What is the one thing you think that we should do that would make this country safer and give us less chance of having a nuclear exchange of some kind?

Dr. KREPINEVICH. I think the most important thing that we can do right now is to understand our nuclear rivals, understand how they calculate cost, benefit, and risk. If we are going to—if the ultimate goal is to prevent the use of these weapons and ultimately we are trying to deter them from using these weapons, then I think we have to understand how they go about calculating cost, benefit, and risk. And there has been a lot of advances over the last 10 years in the cognitive sciences, in the psychological sciences that really have highlighted some of the fundamental differences between cultures, Western cultures and other cultures as to how these factors are calculated.

Dr. KREPINEVICH. Dr. Payne has done a great job of highlighting some of the history of just how leaders, other leaders have undertaken what we would consider highly irrational acts that are within their framework rational. So again I think if that is the ultimate goal, understanding, sort of thinking this through before we start committing huge sums of money one way or the other would be greatly to our benefit.

Mr. FRANKS. Thank you, Mr. Chairman.

Mr. ROGERS. I thank the gentlemen.

The Chair now recognizes Mr. Carson for 5 minutes for any questions he may have.

Mr. CARSON. Thank you, Mr. Chairman.

Dr. Krepinevich, in the event that our nuclear stockpile was significantly reduced, to what degree do you believe our nonnuclear conventional capabilities would ever provide a deterrent? Do you believe that any level of investment in these capabilities could ever create a deterrent to rival our current nuclear deterrent? If not, how close could we get?

Dr. KREPINEVICH. I think, and this goes back to conversations I had with leaders of our Strategic Command after the first Gulf War, even then people like General Horner, General Habiger thought there was a small but significant substitution effect. In other words there were some targets that we could use precision guided weapons for in lieu of nuclear weapons. So again I think there is some substitutability effect there.

On the other hand, the competition isn't static, it's dynamic, and so have you rivals dispersing their assets, they go deep underground, they put them in mountains, and it is this back-and-forth game. So while I think there is some possible substitution there, I don't think it is widespread.

Second, I think that when you are looking at this question, nuclear weapons offer prompt catastrophic destruction, cyber weapons don't, biological weapons don't. Nuclear weapons are in a class all on their own, and for that purpose they are unique. Now to what extent do you need that capability? I think you need it in a lot of ways for deterrence, it is the ultimate threat.

One of the things I think that is becoming worrisome from my point of view is the blurring of this distinction between nuclear weapons and nonnuclear weapons. We now have things like the mother of all bombs, highly destructive conventional weapons, still nothing like a large-yield nuclear weapon. The Russians on the other hand are producing nuclear weapons of extremely small yield again to offset their conventional inferiority. To the extent that you got conventional weapons that in some cases can substitute for nuclear weapons and nuclear weapons that rivals consider to be usable because they are low yield, I think there is a real risk area there. I am not sure I am answering your question, but I do think this is one area that concerns me greatly.

Mr. CARSON. Dr. Krepinevich, thank you, sir.

Dr. Payne.

Dr. PAYNE. Same question?

Mr. CARSON. Yes, sir.

Dr. PAYNE. Great. I believe that there is role for advanced conventional forces to complement deterrence. I have thought that for a good long time. But that is a different point than saying they can substitute for nuclear weapons for deterrence. We know that conventional deterrence fails catastrophically on occasion. We have been to the nuclear-free mountaintop, and what we saw last time is we had 110 million casualties in just over 10 years of warfare. That was the nuclear-zero mountaintop we were at last time. And so I am real careful about saying conventional forces can substitute for nuclear forces for deterrence because we have been there and we have seen what happens and it was pretty ugly. But I think they can complement nuclear weapons for deterrence by making our arsenal more flexible and giving us more options which with to deter.

Dr. BLAIR. I would answer the question by saying there has been a massive substitution over the last 30 years of conventional for nuclear forces. We have relieved ourselves of the need to rely on nuclear weapons for almost all of the missions that we have today. That is one of the reasons why our numbers have gone so dramatically down over the last 25 years.

When I worked at Strategic Command in Omaha for a man who became the vice commander, he put together in 1984 a plan that would have substituted conventional air launch cruise missiles, launched by B-52 [Stratofortress] bombers, to cover all of the soft targets in the Soviet Union to the east of the Ural Mountains. That was shot down by—at the Pentagon because it infringed on the roles and missions of the tactical U.S. Air Force with its conventional missions. But since 1980 and the beginning of cruise missiles and precision guided munitions and now with the advent of amazing information processing and collection, we have basically been in the process of shutting down the nuclear enterprise and replacing it with missile defenses and now with cyber, but also special ops,

drones, all of the things that we at one time in our history would have had to rely on a nuclear weapon to carry out a mission now we have conventional options in our kit bag.

Mr. CARSON. Thank you, gentlemen. Mr. Chairman, I yield back.

Mr. ROGERS. I thank the gentlemen.

The Chair now recognizes Mr. Wilson from South Carolina for 5 minutes.

Mr. WILSON. Thank you, Mr. Chairman and thank you all for being here today. And I certainly agree with Sheriff Nugent that I appreciate the very candid comments from each of you on very important issues to our country.

Dr. Payne, the National Nuclear Security Administration is currently constructing the mixed oxide fuel fabrication facility at the Savannah River site. This facility once complete will dispose of excess plutonium from dismantled nuclear weapons as provided by the 2000 Plutonium Management and Disposition Agreement by the United States and the Russian Federation. There is speculation about reducing or even halting the funding for the project. What is your opinion as to the Russian reaction?

Dr. PAYNE. Sir, I know I know enough to say when I don't know enough to give you an informed answer. On this particular subject I will tell you I don't know enough to give you a very informed answer on the subject.

Mr. WILSON. Again, I said this is candid, you are. So thank you. And Dr. Blair, given the Administration's goal of reducing our Nation's nuclear weapons stockpile it is clear that the National Nuclear Security Administration will need a pathway for plutonium disposition. In fact you referenced this. Do you believe it would be better to dispose of weapons-grade plutonium by turning it into mixed oxide fuel for commercial power generation or do you support indefinite storage of the pits at Pantex and the Savannah River site?

Dr. BLAIR. I don't believe those are the only options. Unfortunately, I think the MOX [mixed oxide nuclear fuel] option is really interesting, but unfortunately that MOX facility is 10 years behind schedule, and over \$10 billion over budget, and it is looking less and less like a viable idea. I think that facility could be and should be used probably to dispose of the plutonium pits through mixing it with waste, all kinds of different plutonium disposition techniques that you know wouldn't involve your facilities that would glassify, vitrify, mix with waste, et cetera, and then move it out and store it in the New Mexico repository probably is the most sensible way to go at this point I am afraid.

Mr. WILSON. And I do need to let you know there is dispute over the numbers you used and also the timeline.

Dr. Krepinevich, you have written a book that sounds intriguing and that is *7 Deadly Scenarios: A Military Futurist Explores War in the 21st Century*. As the author could you just briefly tell us what the top three scenarios you believe are most likely as what you call real-world likely?

Dr. KREPINEVICH. Well, after writing the book the ones that certainly bothered me the most, one had to do with Pakistan coming apart at the seams and breaking into factions, competing factions,

and you had the issue of loose nuclear weapons to consider. So that was one.

Second had to do with nuclear weapons that were sold on the Russian black market that were smuggled into the United States, and it wasn't one weapon, it was a number of weapons. You had a weapon go off and there was—it presented rather unique problems for the political leadership of the country as well as technical problems, and that was the second scenario.

The third had to do with a nuclear-armed Israel and Iran, and the inherent instability of exceedingly short warning times and the willingness of Iran now that it had nuclear weapons to be very aggressive in its pursuit of proxy warfare against Israel.

Mr. WILSON. And with these scenarios has there been any indication of former Soviet nuclear materials coming into the United States?

Dr. KREPINEVICH. No, no, no, there is no bombs, not to my knowledge, being smuggled into the United States. But again looking at the issue of Soviet nuclear security, Soviet organized crime, terrorist operatives in that part of the world and so on, and the funding of certain terrorist groups, that formed the basis for the event that triggered the scenario.

Mr. WILSON. Well, again I appreciate you raising these issues and I in particular in regard to Pakistan I had the privilege and opportunity of actually having breakfast 4 weeks and a day with Benazir Bhutto before she was assassinated, so the possible dissolution of Pakistan certainly is of great concern.

Thank you very much.

Dr. KREPINEVICH. Just very quickly to mention, it turned out Secretary Gates read the book at the time and asked me to come in and write a number of scenarios that they actually wargamed out. So there was some I guess public policy payoff of the book.

Mr. WILSON. Well, congratulations on your recognition. Thank you.

Mr. ROGERS. I thank the gentlemen for yielding back.

I want to go back and revisit a dialogue that Mr. Nugent and Mr. Garamendi were having a little earlier about the difference between the New START Treaty and the PNIs. I think there was some clouding there. Dr. Payne emphasized that the Russians had in his opinion not been complying with the PNIs that preceded the New START Treaty. And my question, Dr. Blair, is do you dispute that the Russians have not been in compliance with the PNIs that preceded New START Treaty.

Dr. BLAIR. No, I wouldn't dispute that. I don't think they have fully strictly complied with the understandings of what we thought they were supposed to do.

Mr. ROGERS. That was my understanding.

Dr. BLAIR. That is one of the reasons why the Global Zero Commission really wants to go the bilateral negotiated verifiable route to reductions in nuclear weapons and not have this fuzzy process out there of unilateral reductions or unilateral understandings of the other person's obligations, et cetera.

Mr. ROGERS. I am in complete agreement with that. I think that we need to have verifiable treaties that go through the Senate, the regular order process. I do note on page 1 of your report it says

that in talking about getting to 900 it says, "These steps could be taken with Russia in unison through reciprocal Presidential directives negotiated in another round of bilateral arms reduction talks or implemented unilaterally." So——

Dr. BLAIR. We looked at all the options. You could do X, Y, or Z but we came down in the end the consensus, unanimous consensus was that the bilateral negotiated treaty approach was the way to go.

Mr. ROGERS. And, that's in the report too?

Dr. BLAIR. Yes.

Mr. ROGERS. Excellent. Thank you. I also want to mention I have had distributed to all of you a chart that was drafted, put together by Admiral Richard Mies and it looks at the global fatalities from major wars around the world over the last 400 years. And you see that approximately 2 percent of the world's population was dying in these wars from 1600 to 1800, then it fell down to about 1 percent. And then we saw in the 1900s, World War I and World War II saw a spike. But right after that with the advent of nuclear weapons we see that for the last 50 years or so the percentage of global fatalities from war has dropped to less than one-tenth of 1 percent. My question is, wouldn't this be hard objective quantifiable data that in fact nuclear weapons do have a chilling effect on warfare as opposed to escalating the probability of major wars? And I would open that up to anybody who wants to respond.

Dr. BLAIR. I think you should survey the landscape of conflict around the world today from Mali to anywhere you want to look, Russia, Georgia, et cetera, Chechnya. And ask yourself the question do nuclear weapons play a role in the 21st century in resolving those conflicts? And I think whatever role they played after the end of World War II and during the Cold War in preserving the peace and preventing great war that's changed, it is a different world.

Mr. ROGERS. I completely agree. Those minor conflicts and relatively to the global population, those are minor, have always existed along with these major wars. And my question is since, this chart lends credibility to the argument that nuclear weapons in fact——

Dr. BLAIR. On the face of it but it is just a correlation that you have to dig deeper into. I mean, I don't think any of us here would want the whole world to go nuclear on the strength of that premise, that nuclear weapons keep the peace. By that logic we would have 198 countries with nuclear weapons and it would be a much more dangerous world obviously. India and Pakistan today, would we prefer that they eliminate their nuclear weapons or keep them on the hope that they preserve the peace between the two countries? You know, as far as I am concerned, I think we are all better off with fewer nuclear weapons in any part of the world.

Mr. ROGERS. And I appreciate and respect that is your view. I have a polar opposite and it is because of this chart that I believe the opposite's true.

Dr. Payne, would like to comment on Admiral Mies' chart?

Dr. PAYNE. Sure. There is enough historical evidence to demonstrate beyond any reasonable doubt that nuclear weapons add usefully to deterrence. This chart aggregates that over 4 centuries, there are also individual case studies in more recent history where

you can go and we understand what was going on with the two parties to know that nuclear deterrence helped prevent war or helped prevent the escalation to war. We know that beyond any reasonable doubt, which is why I am so interested in not focusing on the notion that fewer is better, fewer might be better, fewer might also be worse. The question is do we have the kind of nuclear arsenal that maximizes our ability to deter war and to deter escalation? That is the key question, not whether the number is fewer or more. The question is it the kind of arsenal that contributes most effectively to deterrence because as this chart recognizes nuclear deterrence is a very, very important product. And for us to back away from it, and for example, going towards nuclear zero, what we are risking is getting back to the world we saw there at World War II in a nonnuclear world where nuclear deterrence wasn't operating and we had enormous number of casualties because deterrence failed catastrophically.

Mr. ROGERS. Thank you. The last question I will ask, because I will submit the rest of mine for the record, the last question I ask goes back to a topic raised by Mr. Garamendi which is a very important topic which is the triad. He is right, it is a very costly approach. However, having said that General Kehler, who is the commander, U.S. security forces, recently said, "The Triad of SSBNs, ICBMs, and nuclear capability heavy bombers all with their associated support elements offer a mutually reinforcing strategic package that provides a credible deterrent to our adversaries, assurance to our allies and partners, and flexibility for the President."

What do you all think, I mean that's General Kehler saying that we really need it for all of those reasons for our allies and our President's flexibility. Is it worth the investment that we are making? And I will start with Dr. Krepinevich and then go to Dr. Blair and then Dr. Payne and that will be my time.

Dr. KREPINEVICH. Well, one of the virtues of the triad is that each element has advantages that the other doesn't so they help cover for one another's weaknesses. I would say in the case of bombers, as we have seen in multiple conflicts, bombers have proven useful for conventional deterrence and in conventional warfighting.

Mr. ROGERS. Go back to my point, I don't want to wear out my welcome here with time. Is it worth the investment or not? It is kind of a "yes" or "no" thing.

Dr. KREPINEVICH. I can't give it to you "yes" or "no," Mr. Chairman. You really need to sit down and look at real world problems I think and how you are going to address them.

Mr. ROGERS. Dr. Blair.

Dr. BLAIR. No, it is not worth the investment.

Mr. ROGERS. Dr. Payne.

Dr. PAYNE. It certainly is in the bipartisan congressional strategic posture commission.

Mr. ROGERS. We get one "yes," one "no," and one "I can't say."

With that I yield back. The Chair now recognizes the ranking member for any questions he may have.

Mr. COOPER. Thank you, Mr. Chairman, I appreciate the patience and courtesy of the witnesses here as we explore these important issues. It almost seems to me that we need to have a cou-

ple of closed-session hearings so that we can talk about some things that cannot be aired in public. I thought the chairman's chart was very interesting here. I look forward to reading Admiral Mies' book. I do worry though, I think Dr. Blair put it very well, there is a difference between correlation and causation, a big drop in casualties here but after 1800 you wonder like if the repeating rifle can be credited with that advance or perhaps rifle to barrels or something. I think what this chart fails to show is that if we were to make mistakes now with nuclear weapons the casualty rates would not only go off the chart, it would probably bust through the ceiling of this building and I mean the top floor, because that is the risk with nuclear weapons. Certainly a massive exchange could be extinction of the planet. So I also thought Dr. Blair phrased it very well except for a few powers nuclear weapons really don't play any role at all with a lot of the asymmetric warfare we are seeing around the world in smaller conflicts.

I hope that as these hearings progress we can have fewer arguments about straw men because I think there are so many false impressions that people have. I am very much glad the New START/PNI confusion was cleared up, but I think if we are careful about this we can figure out what an appropriate number is and not really make this political at all. I think it is the first Bush administration that is credited with the greatest percentage reduction in nuclear weapons that we had from 1989 to 1994, but there have been substantial cuts under both administrations. And I think most people agree now that it was probably for the good. So let's see what is feasible based on current information and proceed on that basis.

Thank you, Mr. Chairman, and thank the witnesses for their patience and expertise.

Mr. ROGERS. I thank the gentlemen. Mr. Garamendi, do you have any questions? You are the swan song.

Mr. GARAMENDI. Yes, about a thousand questions. Just a couple of things very quickly. I really agree with the necessity for confidential hearings on this and to really get into the details for all kinds of reasons.

One of the straw men that has been going on here is the issue between zero and some other number. I don't think in my career here which I hope is a good long time I will see zero, but I would hope to see a reduction to a point where there is deterrence, but there is no more than that. So we ought to in my view try to identify what that is.

With regard to the triad, very complex, but very, very important for all the reasons some of which have been discussed here and many, many more.

I just want to cover something that Mr. Wilson brought up and that is the issue of the plutonium pits that are in the United States and in Russia. These are ready-made weapons. This is not something to be—it is something to be really serious about. And the security of those is questionable. The committee has had hearings about that. And if it is questionable it certainly ought to be dealt with. There happens to be a solution, Mr. Blair, and that is to take the pits and to turn them into a metal fuel, which could be done easily and quickly and that fuel could be set aside for some later

use in an integral fast reactor. It is very viable and it does not create the same problems that the MOX facility has. That is an issue for another day and another hearing.

Mr. Chairman, I am just going to let it go at this. These gentlemen have an extraordinary amount of knowledge, they obviously—and I thank you for bringing both sides to the table. We really need to get into this in much, much more detail. It is extremely important for the security of this Nation and beyond. Mr. Cooper made the point that I wanted to make and he made it very well, is that all well and good with this chart, but if—and this is Mr. Krepinevich's book—the first issue he raised the most likely scenario was India-Pakistan, and the potential instability in Pakistan. And should that happen then the nuclear weapon may very well become a conventional use of it or a terrorist use, in which case the numbers here would go way off the chart. And so anything we can do to remove such potential, that is to remove the number of weapons here, there, anywhere, is to our benefit. We understand deterrence and the necessity for that, but that doesn't mean we can't move forward with a reduction in numbers and the delivery mechanisms both by terrorists and by traditional military means. I yield back.

Mr. ROGERS. I thank the gentlemen and I also want to take time to thank all the witnesses for taking their time not only to be here but for the time it takes to prepare for this. I know it takes a lot of effort, and energy, and time and you ought to be commended. Mr. Garamendi is right, you are all very knowledgeable experts and we appreciate your opinions, whatever the opinions are. It is important for us to hear all sides.

To that end, as you know this hearing came at the end of the last series of votes for the day and members went different directions and they weren't all here. So you may have some additional members who have questions for the record. We will ask that the record remain open for 10 days, any members who come in and want to submit questions to you all. I ask that you reply to those in writing.

And with that, thank you for attendance and this meeting is adjourned.

[Whereupon, at 5:33 p.m., the subcommittee was adjourned.]

A P P E N D I X

MARCH 19, 2013

PREPARED STATEMENTS SUBMITTED FOR THE RECORD

MARCH 19, 2013

Statement of Hon. Mike Rogers
Chairman, House Subcommittee on Strategic Forces
Hearing on
The U.S. Nuclear Deterrent: What Are the Requirements
for a Strong Deterrent in an Era of Defense Sequester?
March 19, 2013

Our hearing today is on an important topic: “The U.S. Nuclear Deterrent: What Are the Requirements for a Strong Deterrent in an Era of Defense Sequester?” And, we have a distinguished group of experts to help us consider this subject. They are:

- Dr. Keith B. Payne, Professor and Head, Graduate Department of Defense and Strategic Studies, Missouri State University;
- Dr. Andrew F. Krepinevich, Jr., President, Center for Strategic and Budgetary Assessments; and
- Dr. Bruce Blair, Co-founder, Global Zero.

This Nation has some key decisions ahead of it. We find ourselves in the position of having to recapitalize our entire deterrent at exactly the time that every other nation is growing or modernizing its nuclear forces, but, we have absorbed reductions in our defense budget of \$487 billion and we’re now 18 days into President Obama’s defense sequester that will take another half a trillion dollars out of our defense budget over the next decade. If we can’t fix this problem, we will do what Secretary Panetta described as cuts that would “decimate our defense. It would cripple us in terms of our ability to protect this country.”

I am encouraged that, at least in the short term, DOD understands the importance of the nuclear deterrent and will act to protect it and the central role it plays in the Nation’s security. For example, Deputy Secretary Carter, when testifying before the full committee 2 weeks ago, said that:

“ nuclear deterrence is pretty important. So it’s the last thing that you want to do serious damage to. So I would imagine that the Department of Energy, and the leadership there, and certainly we in the Department of Defense, will try to protect our nuclear capabilities to the maximum extent possible.”

But, I worry that in the long term, this situation will allow the President to further walk back on his commitments to modernize and maintain the deterrent. And these are his commitments he made during the New START treaty. They are his Section 1251 plan he promised to the Senate; this is his Nuclear Posture Review.

As I mentioned at the outset of my remarks, the United States is in the position of having to modernize and replace its entire nuclear triad in the very near future. For example, our sea-based deterrent leg was first commissioned in 1981; our land-based deterrent has been deployed and on-alert since 1970; and, the mainstay of our airborne deterrent has been performing the strategic deterrent mission since 1955. Our nuclear deterrent is the most cost-effective and proven means of promoting peace for the American people and their allies, but we have not been investing in it in a responsible way. Our real and potential adversaries and competitors understand this. Russia, for instance, has tested three new ICBMs since the New START treaty entered into force 2 years ago. The People's Republic of China is preparing to put to sea a ballistic missile submarine and sea-launched ballistic missile and it appears to be readying three new long-range ballistic missiles capable of attacking the United States.

If President Obama is right, and there is peace and security in a world without nuclear weapons, it seems every other country with nuclear weapons—or, like Iran, the aspiration to develop them—has missed the memo. I will add to the record a document derived from open sources that lists summaries of just a few open source articles of what other nuclear weapons states are undertaking today. I note that Russia's Vladimir Putin tells his people that, “[n]uclear weapons remain the main guarantee of Russia's sovereignty and its territorial integrity, it plays a key role in maintaining global and regional stability and balance.”

President Obama, however, said at the State of the Union address last week that, “we will engage Russia to seek further reductions in our nuclear arsenals ... because our ability to influence others depends on our willingness to lead.”

Are they both right? I think General Welch, former Strategic Air Command Commander and former Chief of Staff of the U.S. Air Force, had it right when he said that,

“The only basis for the idea that drastically reducing the number of nukes we have would magically make us safer and help eliminate other nuclear dangers is hope. *But hope is not a plan*, and hope is not a basis for security. *Hope does not defend us*. I would ask who would be willing to rely on hope for the safety and security of their family? ... Leading the world to zero nuclear weapons is, at best, *a fairy tale*.” (emphasis added)

There is a rising consensus from General Scowcroft, Secretaries Perry, Kissinger, Shultz, and Senator Nunn that the one-time frenzy of a world without nuclear weapons is little more than a fantasy, and a dangerous one. For example, the so-called Gang of 4's recent *Wall Street Journal* op-ed piece is a dramatic shift from the original 2007 piece. I think you'll find that the requirements in the March 2013 piece are precisely those Republican Senators and House Members would insist upon:

“Washington should carefully examine going below New Start levels of warheads and launchers, including the possibility of coordinated mutual actions. Such a course has the following prerequisites: a) strict reciprocity; b) demonstrable

verification; and c) providing adequate and stable funding for the long-term investments required to maintain high confidence in our nuclear arsenal.”

Indeed, Secretary Kissinger and General Scowcroft warned in April 2012 that: “[s]trategic stability is not inherent with low numbers of weapons; indeed, excessively low numbers could lead to a situation in which surprise attacks are conceivable.”

This shift by the distinguished elder statesmen is welcome. It may not make the Washington, DC, arms control community happy, because these requirements shut the door on the idea of evading the treaty clause or endorsing the “Global Zero” vision, but they are smart policy. We are at a crisis point where we must focus on the imminent threats of North Korea and Iran.

So, I look forward to examining these matters today. They are important to the Nation’s security and they are matters we will tackle in our markup of the FY14 National Defense Authorization Act.

Statement of Hon. Jim Cooper
Ranking Member, House Subcommittee on Strategic Forces
Hearing on
The U.S. Nuclear Deterrent: What Are the Requirements
for a Strong Deterrent in an Era of Defense Sequester?
March 19, 2013

I would like to join Chairman Rogers in welcoming Dr. Payne, Dr. Krepinevich, and Dr. Blair to this hearing on the U.S. nuclear deterrent.

A recent edition of the *Wall Street Journal* contained the latest opinion piece by four of America's most distinguished defense and foreign policy experts: George Shultz, Bill Perry, Henry Kissinger, and Sam Nunn. Their article is entitled: "Next Steps in Reducing Nuclear Risks: The Pace of Nonproliferation Work Today Doesn't Match the Urgency of the Threat." Their article is perfectly timed for today's hearing, and contains several valuable lessons for this subcommittee.

First, the article is bipartisan. Two top Republicans and two Democrats have joined together to advocate for a better, safer world. They have set aside their differences for the common good. The House of Representatives should learn from their example.

Second, the article is balanced. The authors think that "Washington should carefully examine going below New Start levels of warheads and launchers," but are quick to cite the need for reciprocity, verification, and stable funding. Instead of sloganeering, they seem to be offering a responsible path to reducing America's warheads from 1,550 to a lower number.

Third, they are bullish on the prospect that today's leaders can act promptly and responsibly in order to reduce nuclear risk in the world. They believe that today's leaders can and will do a better job of securing nuclear materials, changing deployments and hair-trigger launch protocols, and engaging in global and regional dialogues. This optimism is not from starry-eyed idealists but from hard-nosed realists.

What worthier challenge could this subcommittee, or this Congress, have than to do what we can in the legislative branch to promote a safer, saner world? Perhaps our goal should be, mindful of our limitations, to do no harm. We should not treat any of these issues as political footballs, or stand in the way of responsible efforts to reduce nuclear risk.

Thank you, Mr. Chairman.

United States House of Representatives
House Armed Services Committee
Subcommittee on Strategic Forces

March 19, 2013

Testimony Prepared By:

Dr. Keith B. Payne
Professor and Head, Graduate Department of Defense and Strategic Studies
Missouri State University
Former Commissioner, Congressional Commission on the Strategic Posture of the United States

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For the past four decades there have been periodic proposals within the US for deep reductions in the US nuclear arsenal. These proposals almost always promote an approach to deterrence and US force sizing that has come to be known over the years as Minimum Deterrence.

The basic Minimum Deterrence argument is that nuclear weapons are so lethal that a small number is adequate for deterrence, and will be so in the future. Consequently, the fundamental Minimum Deterrence claim is that we can make deep nuclear reductions without jeopardizing deterrence.

The number of deployed nuclear weapons typically recommended in Minimum Deterrence proposals ranges from 100 to 1000. The Global Nuclear Zero Commission's report, for example, recommends 450 deployed weapons now, and fewer in the future.¹

Minimum Deterrence proposals typically claim that deep reductions are a requirement of the 1968 Nonproliferation Treaty (NPT), will reduce nuclear dangers, advance US arms control and nonproliferation goals, and save billions of dollars—all without jeopardizing deterrence.

These Minimum Deterrence claims typically are predicated on the following series of nine interrelated propositions:

1. Russia and China are not serious security threats; nuclear deterrence considerations pertinent to a peer nuclear opponent no longer are salient in US security planning.
2. Nuclear weapons are irrelevant to today's most pressing security threat—weapons of mass destruction (WMD) terrorism—therefore, few nuclear weapons are needed for deterrence.
3. US conventional forces can substitute in many cases for nuclear forces to meet pertinent US deterrence goals.
4. Deterrence will function reliably and predictably at low US nuclear force numbers, now and in the future.
5. Deterrence considerations alone determine the size and composition of the nuclear force.

¹ James Cartwright, et al., *Global Zero U.S. Nuclear Policy Commission Report: Modernizing U.S. Nuclear Strategy, Force Structure and Posture* (May 2012), pp. 6, 17.

6. Ballistic missile submarines (SSBN) will remain invulnerable for 30 to 50 years. So, a small SSBN fleet can provide most or all of the nuclear capability needed for US deterrence needs, now and in the future.
7. The number of nuclear weapons and the risk of accidents and crises are directly correlated (more nuclear weapons means increased risk, while a decrease in their number reduces the risk).
8. US nuclear force reductions are essential to strengthen nonproliferation efforts; the NPT requires US movement toward nuclear disarmament.
9. A small number of nuclear weapons is adequate for deterrence, thus US defense spending can be reduced considerably by reducing nuclear forces.

When these core Minimum Deterrence propositions are examined against available evidence, it is apparent that they are demonstrably false, questionable-to-highly dubious, or self-contradictory. These flaws make recommendations derived from Minimum Deterrence equally dubious.

I can give a few examples that illustrate how the elements of Minimum Deterrence are false, dubious or self-contradictory.

Examples of claims that are false:

First, the claim that the NPT requires that the United States now move toward nuclear disarmament places the force of binding treaty obligation behind deep nuclear reductions. Yet, this claim is false: the NPT contains no such obligation. In fact, when Spurgeon Keeny of the NSC explained NPT provisions to Henry Kissinger in 1969, he stated that the reference to nuclear disarmament was “essentially hortatory.”²

Next, the Minimum Deterrence claim that nuclear deterrence, as a rule, is irrelevant to countering terrorism also is false. We know that terrorists can be deterred in some circumstances, and there is no reason to dismiss the potential for US nuclear capabilities to contribute by helping to deter their state sponsors.

Third, Minimum Deterrence also promises substantial savings via nuclear reductions.³ This claim too is demonstrably false because there are not substantial savings in reduced force numbers. As Dr. Don Cook of the National Nuclear Security Administration said in recent testimony, “There are not substantial additional costs in going small, but there are not substantial savings either.”⁴ And, Minimum Deterrence recommendations that the United States substitute

² Spurgeon Keeny, “Provisions of the NPT and Associated Problems,” memorandum to Henry Kissinger, January 24, 1969, [declassified], p. 5, available at <http://2001-2009.state.gov/r/pa/ho/frus/nixon/e2/83203.htm>.

³ See for example, Kingston Reif, “Nuclear Myths (and Realities),” *Bulletin of the Atomic Scientists*, January 15, 2013, at <http://www.thebulletin.org/node/9547>.

⁴ Testimony before the House Appropriates Committee, Subcommittee on Energy and Water, February 14, 2013.

conventional threats for nuclear would likely lead to a net increase in US defense spending. For example, one advanced conventional strategic capability recommended in the Global Zero report alone might cost \$5-\$20 billion to reach initial operational capability,⁵ and many additional conventional force improvements would be necessary.

These three key Minimum Deterrence propositions are false. There is ample evidence that each of the six remaining propositions is questionable at best.

For example, it is impossible to predict credibly that US relations with Russia and China, now and in the future, will be benign with regard to nuclear deterrence. That prediction is inconsistent with considerable current evidence that points to worsening relations with each. Regardless of how we would like to view Russia and China, their open-source discussions of threats and strategy point both to the United States as enemy number one and to the great relevance they attribute to their nuclear weapons.⁶

In addition, it is impossible to claim with any level of credibility that deterrence will work reliably at low force levels, now or in the future.⁷ The workings of deterrence simply are not predictable with such confidence.

Similarly, no one can claim credibly that US conventional threats can substitute for nuclear threats for deterrence. The increasing lethality of conventional forces may mean much or nothing for deterrence purposes, depending on many other key factors.

Likewise, the prediction of SSBN invulnerability for half a century more may prove prescient, but the many possibilities for rapid technological advancement and surprise should discipline any such promises.⁸

Finally, promises that US nuclear reductions will strengthen nonproliferation and reduce nuclear accidents and theft are all contrary to available historical evidence. There is no such correlation

⁵ National Research Council, Committee on Conventional Prompt Global Strike Capability, *U.S. Conventional Prompt Global Strike: Issues for 2008 and Beyond* (Washington, DC: National Academies Press, 2008), p. 40, available at, <http://www.nap.edu/catalog/12061.html>.

⁶ See for example, "The Nuclear Forces and Doctrine of the Russian Federation and the People's Republic of China," October 14, 2011, Testimony Prepared By: Dr. Mark B. Schneider, available at, http://armedservices.house.gov/index.cfm/hearings-display?ContentRecord_id=798a4a17-2a63-45b7-ae79-4629c32dfd7&Statement_id=c9fe3c83-cd34-421c-b98c-ac29bdc094b&ContentType_id=14f995b9-dfa5-407a-9d35-56ec7152a7ed&Group_id=41030bc2-0d05-4138-841f-90b0fbaa0f88&MonthDisplay=10&YearDisplay=2011.

⁷ Even now, for example, Russian experts say that Russian defenses in the future would reduce Russian damage expectancy to 10% if the US follows Minimum Deterrence recommendations. No one knows if such a threat will prove adequate to deter in the future. See, Sergey Rogov, Viktor Yesin, Pavel Zolotarev, Valentin Kuznetsov, "Russia: Experts on Why US, Russia Are Unable to Agree on Missile Defense," *Nezavisimoye Voyennoye Obozreniye*, Online, September 22, 2012, OSC Translated Text.

⁸ For an examination of possible surprises, see Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, *Report of the Defense Science Board 2008 Summer Study on Capability Surprise*, Vol. 1: Main Report, September 2009.

to date between the number of nuclear weapons and accidents, and further US nuclear reductions very likely will increase some allied interest in independent nuclear capabilities—defeating US nonproliferation goals. Some key allied voices already are expressing such concerns openly. In South Korea, for example, a large majority of the population now favors an independent South Korean nuclear capability.⁹

Key Minimum Deterrence claims that are self-contradictory:

Minimum Deterrence claims that a few hundred nuclear weapons are so lethal that they pose a deterrence threat of “catastrophic” dimensions. If true, it cannot also be true that reducing an opponent’s deployed weapons from say 2000 to 1000, or even 500, will provide any great direct benefit for US public safety in the event of an attack: even a few hundred remaining weapons would still cause “catastrophic” destruction.

Similarly, it cannot be true both that Russia is now a friend of the United States and will remain so in the future, and that arms control agreements with Russia will provide great direct security benefit for the United States. If there is no pertinent Russian threat, now or in the future, there can be no direct security benefit to whittling down Moscow’s numbers. The United States typically is unconcerned about the number of French or British nuclear weapons—presumably for the understandable reason that those particular weapons pose no threat to the United States. If Russia similarly is of no security concern, now or in the future, there similarly is no direct security value in focusing obsessively on negotiations to reduce incrementally the number of its nuclear weapons. Yet, facilitating such negotiations is said to be one of the great benefits of Minimum Deterrence.

Also, Minimum Deterrence claims that maintaining effective deterrence is a priority goal. Yet, its nuclear reductions would degrade the US force characteristics that may now be most important for deterrence, i.e., flexibility, resilience and adaptability. These qualities are linked to the size and diversity of the US nuclear arsenal. Consequently, some Minimum Deterrence advocacy of US deep force reductions now actually argues against US force flexibility and resilience,¹⁰ and thereby threatens to degrade deterrence. In 2010, Gen. Kevin Chilton, Commander of Strategic Command, stated in testimony before the Senate that the 1550 deployed warhead ceiling of the New START Treaty was the lowest level he could endorse given this need for flexibility.¹¹ There has been no apparent great benign transformation of international

⁹ See Jiyeon Kim, Karl Friedhoff, Chungky Kang, “The Fallout: South Korean Public Opinion Following North Korea’s Third Nuclear Test,” The Asian Institute for Policy Studies, *Issue Brief*, No. 46 (February 25, 2013), pp. 7–8. See also, Martin Fackler and Choe Sang-Hun, “As North Korea Blusters, South Flirts with Talk of Nuclear Arms,” *New York Times*, March 11, 2013.

¹⁰ Tom Nichols, “Time to Change America’s Atomic Arsenal,” *The Diplomat*, March 14, 2003, at <http://thediplomat.com/2013/03/14/time-to-change-americas-atomic-arsenal/>.

relations since these estimates suggest that flexibility is now less important for deterrence or that lower force levels are now adequate for this purpose.

In addition, if ample deterrence is easily secured at very low force numbers, then it must be true that the United States itself is vulnerable to deterrence by states with small survivable nuclear arsenals, prospectively including North Korea and Iran. If so, the advantages of possessing even a small nuclear force are likely to appear exceedingly attractive to such countries and US reduction of its nuclear arsenal hardly can be expected to have a beneficial nonproliferation effect on these states. Rather, validating Minimum Deterrence may help inspire them and others to seek nuclear capabilities all the more by lowering the bar for securing a nuclear deterrent/coercive capability against the United States.

Finally, Minimum Deterrence recommends that the United States exploit its conventional force advantages to reduce its own reliance on nuclear weapons and thus lead others to reduce their aspirations for nuclear weapons. However, available evidence demonstrates that some states, particularly including Russia, China and North Korea, place greater emphasis on their nuclear weapons *in response* to US conventional advantages. Consequently, the US pursuit of advanced conventional capabilities as recommended by Minimum Deterrence is very likely to lead these countries to emphasize nuclear forces, not follow the US lead toward nuclear disarmament.

The Potential Degradation of Deterrence and Assurance at Very Low US Force Numbers

The problem with Minimum Deterrence is not only that it rests on false, dubious or self-contradictory claims. More importantly is the fact that because it does so, its advocacy for deep force reductions, no “new” US nuclear capabilities, and the application of US nuclear deterrence *only* to opponents’ nuclear threats (“sole purpose”) are likely to undermine the US capacity to deter opponents and assure allies. These policies would:

- Offer fewer choices among warheads and delivery modes and restrict the US capability to adapt to new threats in the future—thereby limiting US flexibility and the prospective effectiveness of US deterrence strategies;
- Inevitably move US deterrence strategies toward threats against civilian-based targets and/or threats against a very small set of military targets: such threats may well be inadequate and/or incredible for some deterrence purposes and purposefully targeting civilian centers violates long-standing moral norms;
- Ease the technical/strategic challenges for opponents who might seek to counter our deterrence strategies and static nuclear capabilities, now or in the future;

¹¹ General Kevin Chilton, Commander, U.S. Strategic Command, *Hearing of the Senate Foreign Relations Committee; Subject: The New START (Strategic Arms Control and National Security) Treaty: Views From the Pentagon*, Federal News Service, June 16, 2010, pp. 18-19.

- Encourage rather than deter some opponents from arms competition and challenges to our deterrence strategies;
- Threaten the US capability to assure allies and thereby encourage some to acquire their own nuclear deterrents—and a possible “cascade” of nuclear proliferation;
- Render US deterrence forces more vulnerable to opponent covert deployments or cheating on arms control agreements in the absence of significant US hedging measures and/or wholly unprecedented and intrusive verification measures; and
- Leave some severe threats by opponents free of any caution imposed by US nuclear deterrence, such as biological, chemical, and cyber threats. This could increase the prospects for such attacks on the United States and allies. For example, the 2013 Defense Science Board report on cyber threats concludes “that a survivable nuclear triad...is required” to anchor US deterrence capabilities against the cyber threat.¹²

Guidelines That Do Fit Available Evidence

The same evidence that demonstrates Minimum Deterrence claims to be false, dubious, or self-contradictory also suggests a better set of guidelines given contemporary realities. I should note that the six guidelines below are fully in line with the conclusions of the bipartisan Congressional Strategic Posture Commission’s 2009 report.¹³

- Promises that neither Russia nor China will pose threats in the future that involve nuclear deterrence are completely incredible and at variance with considerable contemporary evidence. US policy makers must take into account that US nuclear deterrence strategies need to be applicable to great nuclear powers, peers, regional opponents, and state sponsors of terror who might otherwise enable terrorist organizations to acquire weapons of mass destruction.
- Confident predictions about the future functioning of deterrence in a highly dynamic environment are particularly incredible. In such an environment, informed estimates of US deterrence requirements must be based on an understanding of opponents’ likely decision making in plausible threat contexts.
- In a highly-dynamic environment, deterrence requirements will be as varied and shifting as are opponents and contexts. One approach will not fit all with regard to US deterrence planning and forces. It is logical and reasonable in such an environment to expect that US deterrence forces with flexibility and resilience can help US deterrence strategies adapt to shifting requirements and be as effective as is possible. These key deterrence

¹² Department of Defense, Defense Science Board, *Resilient Military Systems and the Advanced Cyber Threat*, January 2013, pp. 15, 42.

¹³ See William Perry and James Schlesinger, et. al., Congressional Commission on the Strategic Posture of the United States, *America’s Strategic Posture* (Washington, D.C.: U.S. Institute of Peace, 2009).

qualities are linked to the size and diversity of the US arsenal and their preservation should be a high priority in the calculation of US force adequacy. It is for this reason that the bipartisan Strategic Posture Commission emphasized the preservation of the US nuclear Triad; it offers considerable inherent flexibility, diversity and resilience.¹⁴

- Given the need for effective deterrence and the corresponding value of force flexibility, resilience, the United States should be most careful to avoid arms control and other restrictive measures that would lock in an undiversified and inflexible arsenal—whether done by treaty, executive agreement or unilaterally. Minimum Deterrence proposals for very low force numbers, the elimination of the Triad, and a standing policy of no “new” US capabilities are particularly dangerous in this regard: the potential degradation of deterrence would be a high-risk trade-off for its fragile promises of benefit. In contrast, the great value of the Triad in this regard is why virtually no one outside of Minimum Deterrence favor its elimination.
- The integrity of US alliances and preservation of US nonproliferation goals likely depend on the credible US assurance of allies, including nuclear assurances. Given these priority goals, the United States must understand the unique security challenges and fears of allies, and size and structure US forces with the unique requirements of assurance in consideration. Deterrence and assurance are separate functions and their requirements will frequently differ. Here too we should be most careful to avoid arms control and other restrictive measures that would lock in an arsenal that is too narrow and inflexible to support the assurance of allies. Again, Minimum Deterrence proposals for deep force reductions, the elimination of the Triad, the removal of dual capable aircraft from Europe, and a standing policy of no “new” capabilities are particularly risky in this regard.
- The functioning of deterrence is not predictable and in some plausible cases, it will not work. This reality suggests the potentially great value of US defensive capabilities, including missile defense, to provide protection for US society in the event deterrence fails. This goal, too, should be a factor in US force-sizing calculations. The emergence of new nuclear powers with modest arsenals and extreme hostility for the United States suggests the growing value and practicality of such defenses. The recent severe nuclear missile threats to the United States announced by North Korea, and the Obama administration’s rhetorical emphasis on US national missile defense in response, are a reminder of that value.¹⁵ Downplaying the need for national defenses against at least limited threats in favor of fragile Minimum Deterrence promises would be another high-risk trade-off.

¹⁴ Ibid., pp. 25-26, 29.

¹⁵ Press Briefing by Press Secretary Jay Carney, Office of the Press Secretary, The White House, March 7, 2013.

A Modern-Day Ten Year Rule

Minimum Deterrence is a contemporary version of the famous British Ten Year Rule. In August 1919, Britain, exhausted by World War I, established the Ten Year Rule. British armed forces were instructed to estimate their requirements and budget “on the assumption that the British Empire would not be engaged in any great war during the next ten years.”¹⁶ This rule was to be in effect “on a daily moving basis” until such time as it was expressly removed.¹⁷ Based on this hopeful prediction of a benign future and comparable high hopes for naval disarmament negotiations, British naval allocations were cut by 85 percent between 1919 and 1923.¹⁸ The British government did not rescind the Ten Year Rule until 1932, and even then admonished that this did not mean the end of austere budgets. Of course, Britain began the struggle for its existence with a resurgent Germany seven years later and was ill-prepared for such a struggle, in part as a result of this rolling Ten Year Rule that codified the optimistic hope for a benign future and deferred prudent military preparation.

The Ten Year Rule was premised on a view of the international environment that fit the hopes and desires of an exhausted, war-weary Britain; but those hopes became increasingly surreal through the 1920s and early 1930s.

Today, in the United States, Minimum Deterrence is very much akin to the Ten Year Rule, except that its recommendations would lock in “legally binding” US reductions and make recovery and adjustment very difficult, lengthy and costly in the event of a darker future than predicted. And, it would do so at a time when Russia and China are modernizing their nuclear capabilities while explicitly threatening US allies and naming the United States as the primary opponent, and rogue states are moving forward on nuclear weapons and multiple means of delivery while also threatening the United States and allies.

Britain finally abandoned the Ten Year Rule in 1932 after developments in Europe and Asia demonstrated that its premise did not reflect reality. Minimum Deterrence proponents have yet to reconsider their hoped-based predictions, despite abundant evidence that they are wrong, questionable or self-contradictory.

During the period that the Ten Year Rule was in effect, Britain and the United States promoted various disarmament negotiations. The late celebrated US diplomat and historian, George Kennan, offered the following indictment of these efforts: “A...line of utopian endeavor that preoccupied American statesmanship over long periods of time was the attempt to arrive at multilateral arrangements for disarmament...at the very time this mountainous labor was in progress, Weimar Germany was disintegrating miserably into the illness of

¹⁶ See Paul Kennedy, *The Rise and Fall of British Naval Mastery* (New York: Humanity Books, 1998), p. 273.

¹⁷ Ibid., p. 279.

¹⁸ Ibid., p. 274.

National Socialism, and new political realities were being created which were to sweep all this labor from the scene... The evil of these utopian enthusiasms was not only, or even primarily, the wasted time, the misplaced emphasis, the encouragement of false hopes. The evil lay primarily in the fact that these enthusiasms distracted our gaze from the real things that were happening... The cultivation of these utopian schemes, flattering to our own image of ourselves, took place at the expense of our feeling for reality. And when the rude facts of the power conflict finally did intrude themselves directly upon us, in the form of enemies against whom we were forced to fight in the two World Wars, we found it difficult to perceive the relation between them and the historical logic of our epoch, because we understood the latter so poorly."¹⁹

The same can be said of Minimum Deterrence proposals today.

¹⁹ George F. Kennan, *Realities of American Foreign Policy* (London: Oxford University Press, 1954), pp. 20-23.

Dr. Keith B. Payne

Keith Payne is President and co-founder of the National Institute for Public Policy, a nonprofit research center located in Fairfax, Virginia. Dr. Payne also is Professor and Head of the Graduate Department of Defense and Strategic Studies, Missouri State University (Washington Campus).

Dr. Payne served in the Department of Defense as the Deputy Assistant Secretary of Defense for Forces Policy. He received the Distinguished Public Service Medal and the Forces Policy office Dr. Payne led received a Joint Meritorious Unit Award. In this position, Dr. Payne was the head of U.S. delegation in numerous allied consultations and in “Working Group Two” negotiations on BMD cooperation with the Russian Federation. In 2005 he was awarded the Vicennial Medal for his many years of graduate teaching at Georgetown University.

Dr. Payne is the Chairman of the U.S. Strategic Command’s Senior Advisory Group, Strategy and Policy Panel, editor-in-chief of *Comparative Strategy: An International Journal*, and co-chair of the U.S. Nuclear Strategy Forum. He served on the bipartisan Congressional Commission on the Strategic Posture of the United States, the Secretary of State’s International Security Advisory Board, as co-chairman of the Department of Defense’s Deterrence Concepts Advisory Group, and also as a participant or leader of numerous governmental and private studies, including White House studies of U.S.-Russian cooperation, Defense Science Board Studies, and Defense Department studies of missile defense, arms control, and proliferation. He also has served as a consultant to the White House Office of Science and Technology Policy, the Arms Control and Disarmament Agency, and participated in the 1998 “Rumsfeld Study” of missile proliferation.

Dr. Payne has lectured on defense and foreign policy issues at numerous colleges and universities in North America, Europe, and Asia. He is the author, co-author, or editor of over one hundred and twenty published articles and seventeen books and monographs, some of which have been translated into German, Russian, Chinese or Japanese. His most recent book is entitled, *Understanding Deterrence* (2013). Dr. Payne’s articles have appeared in many major U.S., European and Japanese professional journals and newspapers.

Dr. Payne received an A.B. (honors) in political science from the University of California at Berkeley in 1976, studied in Heidelberg, Germany, and in 1981 received a Ph.D. (with distinction) in international relations from the University of Southern California.

**DISCLOSURE FORM FOR WITNESSES
CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 113th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Committee on Armed Services in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

Witness name: Keith B. Payne

Capacity in which appearing: (check one)

☒ Individual

☐ Representative

If appearing in a representative capacity, name of the company, association or other entity being represented:

FISCAL YEAR 2013

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant

FISCAL YEAR 2012

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant

FISCAL YEAR 2011

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2013): _____;
 Fiscal year 2012: _____;
 Fiscal year 2011: _____.

Federal agencies with which federal contracts are held:

Current fiscal year (2013): _____;
 Fiscal year 2012: _____;
 Fiscal year 2011: _____.

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2013): _____;
 Fiscal year 2012: _____;
 Fiscal year 2011: _____.

Aggregate dollar value of federal contracts held:

Current fiscal year (2013): _____;
 Fiscal year 2012: _____;
 Fiscal year 2011: _____.

Federal Grant Information: If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2013): _____;

Fiscal year 2012: _____;

Fiscal year 2011: _____.

Federal agencies with which federal grants are held:

Current fiscal year (2013): _____;

Fiscal year 2012: _____;

Fiscal year 2011: _____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2013): _____;

Fiscal year 2012: _____;

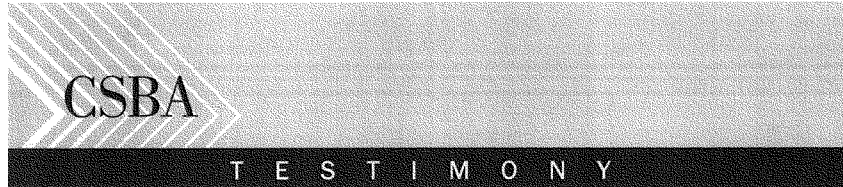
Fiscal year 2011: _____.

Aggregate dollar value of federal grants held:

Current fiscal year (2013): _____;

Fiscal year 2012: _____;

Fiscal year 2011: _____.



March 6, 2013

**U.S. NUCLEAR REQUIREMENTS
IN AN ERA OF DEFENSE AUSTERITY**

**TESTIMONY BEFORE THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON STRATEGIC FORCES**

**By Andrew F. Krepinevich, Jr.
President
Center for Strategic and Budgetary Assessments**

Chairman Rogers, Ranking Member Cooper, and Members of the Subcommittee, thank you for your invitation to testify this afternoon on the subject of U.S. nuclear requirements. My testimony¹ addresses the prospective risks and benefits that may accrue should the United States pursue significant reductions in its nuclear forces beyond those called for in the New START agreement.

Background to the Current Situation

Post-Cold War Drawdown

After amassing large nuclear arsenals during the forty-year Cold War, both the United States and Russia have made deep reductions in these forces since the fall of the Berlin Wall in 1989. These reductions were enabled by the subsiding tensions between the two countries that began in the late 1980s and that continued through the collapse of the Soviet state in December 1991. They were further enabled by the corresponding decline in the size and effectiveness of Russia's conventional forces, which left the U.S. military in a position of unchallenged conventional superiority—a reality demonstrated by the decisive victory over the Iraqi military in 1991. At the time there were no other comparable nuclear powers, which also facilitated the remarkable drawdown of U.S. and Russian nuclear forces.

By 2010 the United States nuclear arsenal comprised 5,113 active and inactive warheads, including both strategic and non-strategic weapons.² This represents an 84 percent

¹ My testimony draws significantly from ongoing research by several of my CSBA colleagues, in particular Evan Braden Montgomery and Barry D. Watts. Any shortcomings in my remarks are, of course, solely my own.

² Department of Energy, "Increasing Transparency in the U.S. Nuclear Stockpile," Fact Sheet, May 3, 2010, p. 1. Active warheads include strategic and non-strategic weapons maintained in an operational, ready-for-use configuration, as well as warheads that must be ready for possible deployment within a short timeframe and logistics spares. They have tritium bottles and other Limited Life Components installed. Inactive warheads are maintained at a depot in non-operational status, and have their tritium bottles removed.

reduction from the U.S. nuclear arsenal's peak of 31,255 warheads in 1967, and a 77 percent reduction from the 22,217 total in 1989. The sharpest decline in the U.S. nuclear stockpile took place from 1989 to 1994, during which it was reduced by half. The Soviet/Russian nuclear stockpile also underwent similarly large reductions during this timeframe. Unclassified sources indicate that the Soviet stockpile peaked at over 40,000 strategic and non-strategic nuclear weapons in the mid-1980s.³ Recent Congressional testimony by U.S. Department of Defense (DoD) officials indicates that Russia's current stockpile is between 4,000 and 6,500 nuclear weapons, of which 2,000 to 2,500 are considered strategic weapons.⁴ Russia's nuclear stockpile has therefore undergone a reduction of 84 to 90 percent since its peak during the mid-1980s. The reduction to date since 1989 is 82 to 89 percent.⁵ The most rapid decline in Russian nuclear weapons took place from 1989 to 1996, during which it was cut by over 60 percent.

New START

The 2011 New START Treaty entered into by the United States and Russia is the latest in a series of agreements intended to reduce the two countries' nuclear forces. That being said, neither U.S. nor Russian officials have been completely forthcoming regarding their existing stockpiles of nuclear weapons. The figures both countries have recently made public under New START reporting requirements are for strategic warheads on deployed ICBMs, SLBMs, and heavy bombers. As of September 2012, the United States reported 1,722 strategic warheads on 806 deployed ICBMs, SLBMs, and heavy bombers, while the Russians reported 1,499 warheads on 491 deployed strategic launchers.⁶ These numbers, however, do not capture all the nuclear weapons permitted under the treaty. New START's counting rule for heavy bombers counts only one warhead for each nuclear-capable heavy bomber against the deployed warhead limit of 1,550.⁷ Yet maximum loads for the 76 B-52Hs and 20 B-2s allow over 1,700 U.S. nuclear bomber weapons to go "uncounted." Similarly, maximum loads for Russia's 63 Tu-95 and 13 Tu-160 bombers would enable the Russians to deploy at least another 760 weapons over the 1,550-warhead limit.⁸ Thus, while a cursory look at the New START agreement may give the impression that both the United States and Russian Federation are limited to 1,550

³ Natural Resources Defense Council (NRDC), "Table of USSR/Russian Nuclear Warheads," available at <http://www.nrdc.org/nuclear/nudb/datab10.asp>, accessed on November 29, 2012; and William J. Perry and James R. Schlesinger, *America's Strategic Posture* (Washington, DC: United States Institute of Peace Press, 2009), p. 111.

⁴ James N. Miller, Statement before the House Committee on Armed Services, November 2, 2011, p. 1; and Madelyn Creedon and Andrew Weber, Joint Statement for the Record, Strategic Forces Subcommittee, Committee on Armed Services, U.S. Senate, March 28, 2012, p. 2.

⁵ The NRDC's database on USSR/Russian warheads estimates that in 1989 the USSR had 12,177 strategic and 23,700 non-strategic warheads for a total of 35,817. NRDC, "Table of USSR/Russian Nuclear Warheads."

⁶ State Department, "New START Treaty Aggregate Numbers of Strategic Offensive Arms," Fact Sheet, October 3, 2012. When the first New START data exchange occurred in February 2011, the United States reported 1,800 warheads on deployed ICBMs, SLBMs, and heavy bombers; Russia reported 1,537. Thus, from February 2011 to September 2012, Russia's deployed strategic warheads increased, whereas the United States' decreased.

⁷ "Treaty between the United States of American and the Russian Federation for the Further Reduction and Limitation of Strategic Offensive Arms," Article III, paragraph 1.(c).

⁸ If the load-out for the Tu-95MS Bear is limited to six Kh-55 cruise missiles carried internally to maximize range, then the Russian bomber force would only add 396 uncounted nuclear weapons.

deployed strategic warheads each, for a combined total of 3,100, the counting rules relating to bombers permit as many as another 2,500 warheads to go uncounted. New START also allows both parties to maintain 100 non-deployed ICBMs, SLBMs, and heavy bombers over and above the 700 permitted to each side by the treaty. Moreover, any strategic warheads stockpiled for these launchers are not counted. In short, New START has some significant loopholes. While it constrains launchers, its 1,550-warhead limit by no means constrains the United States and Russia to a combined total of 3,100 warheads. Ignoring stockpiled warheads—whose numbers could be considerable, the United States could have nearly 3,330 strategic weapons and Russia over 2,300 within the 1,550 limit on deployed weapons.

Then there are the “non-strategic” or “tactical” nuclear warheads, many of which have yields greater than the bombs dropped on Hiroshima and Nagasaki. New START does not address these weapons, much less limit them. A study by the Federation of American Scientists (FAS) published in May 2012 estimated that the United States has some 760 of these non-strategic nuclear weapons while Russia has over 2,000.⁹ Adding these figures for U.S. and Russian non-strategic warheads to the maximum totals allowed under New START brings the active U.S. stockpile to over 4,000 nuclear weapons and Russia’s stockpile to at least 4,700. However, Defense Department estimates of Russian non-strategic nuclear weapons range from 2,000 to 4,000 weapons, which means the active Russian stockpile could be as high as 6,500 weapons.¹⁰ Based on the U.S. stockpile figure for 2009 of 5,113 weapons (reported in 2010) and the roughly 90 fewer strategic warheads the United States reported in September 2012 under New START, a reasonable estimate for the active U.S. stockpile would appear to be roughly 5,000 nuclear weapons.¹¹

Further Reductions?

The Obama administration has committed itself to the eventual elimination of the world’s nuclear weapons. This effort is often referred to as “Global Zero.” By far the most influential presentation of this view has been advanced by Henry Kissinger, Sam Nunn, William Perry and George Shultz, highly regarded senior statesmen from both political parties.¹² The “Four Horsemen of the Apocalypse,” as they have been called, argue that

⁹ According to this study, the United States’ non-strategic inventory consists of around 500 B61 bombs plus some 260 W80-0 warheads (in storage for the TLAM-N); the Russian non-strategic inventory includes nuclear bombs, torpedoes, depth charges, warheads for the SS-21 Tochka and SS-26 Iskander short-range ballistic missiles, and warheads for the A-135 and S-300 antiballistic missile systems. Hans M. Kristensen, “Non-Strategic Nuclear Weapons,” *Federation of American Scientists*, Special Report No. 3, May 2012, pp. 14, 53-54. A more recent study estimates the total number of operationally assigned Russian non-strategic nuclear warheads to be 860 to 1,040. See Igor Sutyagin, “Atomic Accounting: A New Estimate of Russia’s Non-Strategy Nuclear Forces,” *Royal United Services Institute for Defence and Security Studies*, Occasional Paper, November 2012, pp. 2-3. However, Kristensen’s higher total is based on nominal loadings plus weapons in storage or awaiting dismantlement. Sutyagin’s estimate only includes “those that have been assigned to available delivery systems.” *Ibid.*, p. 1.

¹⁰ Hans M. Kristensen, “Non-Strategic Nuclear Weapons,” *Federation of American Scientists*, Special Report No. 3, May 2012, p. 50.

¹¹ The preceding discussion of the U.S. and Russian post-Cold War nuclear forces is drawn from Barry D. Watts, *Nuclear-Conventional Firebreaks and the Nuclear Taboo* (Washington, DC: Center for Strategic and Budgetary Assessments, forthcoming in 2013).

¹² George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn, “A World Free of Nuclear Weapons,” *The Wall Street Journal*, January 5, 2007; and George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn, “Toward a Nuclear-Free World,” *The Wall Street Journal*, January 15, 2008.

the world is at a “nuclear tipping point” in which “nuclear weapons [are] more widely available, [and] deterrence decreasingly effective and increasingly hazardous.” The result is that “the world is now on the precipice of a new and dangerous nuclear era. Most alarmingly, the likelihood that non-state terrorists will get their hands on nuclear weaponry is increasing.”¹³ This stems from fears that the instability that plagues several existing and prospective nuclear states could lead to the collapse or overthrow of their governments. Should that occur, the security of their nuclear weapons could be jeopardized, and the likelihood of a nuclear weapon or fissile material finding its way into the hands of terrorist groups would increase substantially. Moreover, it is not inconceivable that, in the event of a more proliferated world, radical nuclear-armed states might transfer nuclear arms or fissile material to radical nonstate entities.

Nuclear abolitionists generally admit that the path to achieving their ultimate goal is likely to be long and difficult, and so they advocate taking a series of interim steps to generate momentum. For them, New START represents one of these small steps.

The Obama administration appears to be planning to take another such step. Since the New START treaty entered into force in February 2011, the administration has signaled that it will seek further reductions in the U.S. nuclear arsenal.¹⁴ Along these lines, a 2012 report chaired by the former vice chairman of the Joint Chiefs of Staff, General James Cartwright, argued that by 2022 the United States could reduce its strategic arsenal to 500-900 warheads, eliminate all tactical nuclear weapons, and shift to a dyad of B-2 bombers and fleet ballistic missile submarines (SSBNs), eliminating nuclear ICBMs, the third leg of America’s nuclear triad.¹⁵ Moreover, the report insisted, these steps could be taken either in unison with Russia or unilaterally. Perhaps most important, however, is that the new secretary of defense, Chuck Hagel, served on the commission and put his name to the report.¹⁶

¹³ George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn, “A World Free of Nuclear Weapons,” *The Wall Street Journal*, January 5, 2007; and George P. Shultz, William J. Perry, Henry A. Kissinger and Sam Nunn, “Toward a Nuclear-Free World,” *The Wall Street Journal*, January 15, 2008. For a discussion of the dangers associated with nuclear terrorism, see Graham T. Allison, *Nuclear Terrorism* (New York: Owl Books, 2004); and Andrew F. Krepinevich, *7 Deadly Scenarios* (New York: Bantam Books, 2009), pp. 63-90, and 238-241. See also Evan Braden Montgomery, *Nuclear Terrorism: Assessing the Threat, Developing a Response* (Washington, DC: CSBA, 2009).

¹⁴ David E. Sanger, “Obama to Renew Drive for Cuts in Nuclear Arms,” *The New York Times*, February 10, 2013, available at http://www.nytimes.com/2013/02/11/us/politics/obama-to-renew-drive-for-cuts-in-nuclear-arms.html?_r=0, accessed February 11, 2013. The administration’s 2012 strategic guidance includes this comment: “It is possible that our deterrence goals can be achieved with a smaller nuclear force, which would reduce the number of nuclear weapons in our arsenal as well as their role in national security.” Department of Defense, “Sustaining U.S. Global Leadership: Priorities for 21st Century Defense,” January 2012, p. 5.

¹⁵ “Modernizing U.S. Nuclear Strategy, Force Structure, and Posture,” Global Zero U.S. Nuclear Policy Commission Report, May 2012, pp. 1, 6-8, and 20. The report is available at http://www.globalzero.org/files/gz_us_nuclear_policy_commission_report.pdf, accessed May 20, 2012.

¹⁶ Others whose names appear as members of the commission are Ambassador Richard Burt, Ambassador Thomas Pickering, and General (Retired) Jack Sheehan. General (Retired) James Cartwright served as the commission’s chair, and Bruce Blair as the study director.

How to Think About Further Reductions

Would it make sense for the United States to pursue significant additional reductions in its nuclear forces and, if so, under what conditions? This is a very complicated issue, and it pertains to a capability that has represented a major U.S. strategic asset for nearly 70 years. Given the stakes involved, a thorough assessment of the situation is merited. How would one structure such an assessment? What issues would need to be addressed to assist the administration and Congress in coming to a decision? I offer the following framework, along with some preliminary analysis.

In its 2010 Nuclear Posture Review, the Obama administration declared that so “long as nuclear weapons exist, the United States must sustain a safe, secure, and effective nuclear arsenal—to maintain strategic stability with other major nuclear powers, deter potential adversaries, and reassure our allies and partners of our security commitments to them.”¹⁷ This statement by the administration offers a sound basis for considering the purposes served by our nuclear forces, which can be summarized as follows:

- Precluding the use of nuclear weapons against the United States, to include our territory and our military forces overseas through whatever means necessary, to include deterrence, dissuasion, and preventive or preemptive action.
- Deterring other forms of aggression or coercion against ourselves and our security partners; and
- Supporting efforts to arrest the use of nuclear weapons promptly should they be used by another party.
- Discouraging the proliferation of nuclear weapons, in part by dissuading treaty allies and partners from acquiring nuclear weapons by providing nuclear guarantees—extended deterrence—that relieves them of the need to acquire their own nuclear forces.

In these ways nuclear forces support the United States’ overriding objective of extending the tradition of non-use of nuclear weapons. Arguably with the U.S. military’s considerable advantage in conventional military capability, extending this tradition has acquired even greater value over the past two decades.

Might these objectives be enhanced or compromised through further significant reductions in the U.S. nuclear arsenal?

Would a reduction in U.S. nuclear forces lead other nuclear powers to reduce their arsenals, or aspiring nuclear powers to forego acquiring nuclear weapons, or both?

(Not) Following the Leader

Some of those who advocate further significant reduction in U.S. nuclear forces state that leading by example will stimulate other nuclear powers to follow suit and/or prospective

¹⁷ Department of Defense, “Nuclear Posture Review Report,” April 2010, p. i.

nuclear powers to forgo the acquisition of nuclear weapons. Should this occur, they believe, it would also reduce the likelihood of nuclear weapons use.

The evidence to date does not appear to bear this out. Both the United States and Russia have drastically reduced their nuclear arsenals since the end of the Cold War, yet the states of greatest concern—those that are hostile to the United States or who have authoritarian regimes—have not followed suit. Over the past twenty years the world has added three new nuclear powers: India, North Korea and Pakistan. Iraq might be a nuclear power today if not for U.S. military action in 1991, and an Israeli military strike ten years earlier. Iran is almost certainly pursuing a nuclear weapons capability, and Syria appeared to be seeking one as well prior to a 2007 Israeli strike on a nuclear reactor it had under construction.

In brief, there is no conclusive evidence that other states have reduced their nuclear arsenals or curbed their nuclear ambitions because of the example set by the United States and Russia.

The Nuclear Umbrella and “Friendly” Proliferation

In fact, the opposite may be true. Reductions in the U.S. nuclear forces, either in concert with Russia or unilaterally, may undermine the credibility of Washington’s nuclear guarantees to allies and key security partners. Unlike Russia, the United States extends a nuclear umbrella over many countries, particularly in Europe and East Asia. Depending on how large any further reductions to the U.S. nuclear forces are, those states sheltering under this umbrella may come to doubt its worth, even to the point where they decide to pursue their own nuclear capabilities. The United States currently maintains such commitments to a number of non-nuclear powers, including its NATO allies (in particular a non-nuclear Germany), Japan, and South Korea, states that could quickly acquire a nuclear capability if they chose to do so. Even if they do not pursue the path of proliferation, some may decide to loosen their security relationship with the United States in favor of arrangements with other states, some of whom may not be on friendly terms with Washington. This would hardly seem to enhance U.S. security or result in fewer fingers on the nuclear trigger.

Complicating matters further, should efforts to prevent Iran from acquiring a nuclear capability fail, the Obama administration has advanced the possibility that U.S. nuclear guarantees might be extended to countries in the Middle East.¹⁸ Thus the commitment of U.S. nuclear weapons to the defense of other states would be *increasing* while the United States’ arsenal is *decreasing*. The implied assumption here is that the United States has a large surplus of nuclear weapons, and that it can readily meet its expanding nuclear commitments with a substantially smaller arsenal than called for under New START.

Does such a surplus exist? The answer to this question resides in the minds of those under the U.S. nuclear umbrella and those who would threaten them with nuclear attack or use

¹⁸ In July 2009, Secretary of State Hillary Clinton advanced the idea of extending U.S. nuclear guarantees to countries in the region: “We want Iran to calculate what I think is a fair assessment that if the United States extends a defense umbrella over the region, if we do even more to support the military capacity of those in the Gulf, it’s unlikely that Iran will be any stronger or safer because they won’t be able to intimidate and dominate as they apparently believe they can once they have a nuclear weapon. Quoted in James A. Russell, “Extended Deterrence, Security Guarantees and Nuclear Weapons: U.S. Strategic Policy Conundrums in the Gulf,” *Strategic Insights*, December 2009.

nuclear weapons as a means of coercion. Do we have some sense of how they view the situation? How they calculate cost, benefit and risk?

U.S. Conventional Forces and the Great Equalizer

The large advantage the U.S. military enjoys in conventional military capabilities strongly suggests that further reductions in U.S. nuclear forces are unlikely to stimulate similar actions by the nuclear powers Washington worries about most, or to retard the efforts of those seeking to acquire a nuclear capability. As India's defense minister observed after the U.S. military's stunning dismantlement of Iraq's military in the First Gulf War, "Don't fight the United States unless you have nuclear weapons."¹⁹ His advice appears to have been taken to heart by states long hostile toward the United States, including Iran, Libya, North Korea and Syria, all of which have sought to acquire their own nuclear weapons. These states, who cannot hope to match the U.S. military's conventional capabilities, would clearly understand the logic behind Josef Stalin's injunction to nuclear physicist Igor Kurchatov at the end of World War II: "Build the bomb—it will remove a great danger from us."²⁰

Both Russia and Pakistan cite their inferiority in conventional forces relative to those of their prospective enemies as reasons for maintaining—and modernizing—their nuclear forces. Russia currently has plans for tripling its production of nuclear missiles, including new SLBMs and a heavy ICBM capable of carrying 10-15 warheads. Tests are being performed to enhance the reliability of Russia's new generation of very-low-yield tactical nuclear weapons.²¹ President Vladimir Putin has stated Russia plans to add 400 new ICBMs and SLBMs to Russia's strategic forces in the coming decade.²²

For its part Pakistan is constructing a series of plutonium production nuclear reactors that could increase its nuclear weapons production capability from 7-14 weapons per year to between 20 and 25 weapons.²³ In addition to expanding weapons production, Pakistan may also want the additional plutonium to enhance the quality of its arsenal and to facilitate efforts to build a new generation of lighter yet more powerful warheads.²⁴

¹⁹ Quoted in Samuel P. Huntington, "The Clash of Civilizations," *Foreign Affairs*, Summer 1993, p. 48.

²⁰ Accessed at http://www.pbs.org/redfiles/kgb/inv/kgb_inv_ins.htm, on March 1, 2013.

²¹ Mark Schneider, "The Nuclear Forces and Doctrine of the Russian Federation and the People's Republic of China," prepared statement, U.S. House of Representatives, Armed Services Committee, Subcommittee on Strategic Forces, October 14, 2011, pp. 2-3.

²² Vladimir Putin, "Being Strong: National Security Guarantees for Russia," *Rossiyskaya Gazeta*, February 28, 2012, English translation available at <http://www.voltairenet.org/article172934.html>, accessed on December 12, 2012; and "Strategic Rocket Forces," as of April 12, 2012, available at <http://russianforces.org/missiles/>, accessed on December 12, 2012. The original Russian is available at <http://www.rg.ru/2012/02/20/putin-armiya.html>.

²³ David Albright and Paul Brannan, "Pakistan Doubling Rate of Making Nuclear Weapons: Time for Pakistan to Reverse Course," *Institute for Science and International Security*, May 16, 2011. Pakistan had one heavy water reactor at its Khushab nuclear site at the time of its nuclear tests in 1998. Between 2000 and 2002 it began construction of a second heavy water reactor at Khushab, followed by the initiation of construction of yet another reactor in 2006. Construction is apparently now underway on a fourth reactor, also at Khushab.

²⁴ David Albright and Paul Brannan, "Pakistan Doubling Rate of Making Nuclear Weapons: Time for Pakistan to Reverse Course," *Institute for Science and International Security*, May 16, 2011.

For these countries nuclear weapons are the “great equalizer” that offset their inferiority in conventional military power relative to current or prospective rivals. To the extent this perspective prevails, the size of other nuclear arsenals,²⁵ to include the U.S. nuclear arsenal, is at best a secondary consideration. For Pakistan and Russia, reducing their nuclear forces would be tantamount to compromising their security.

Unintended Consequences: Lowering the Entry Barrier

At some point, undertaking substantial additional nuclear force reductions beyond those called for in New START may tempt existing and prospective nuclear powers to create arsenals on a par with the United States and Russia. It is not possible to state precisely at what point such reductions will stimulate this behavior. Different competitors will almost certainly have different thresholds. It would make sense to try and identify what these thresholds are lest efforts to reduce the global stock of nuclear weapons actually produce the opposite effect.

Summary

In brief, based on the evidence of U.S. and Russian nuclear force reductions over the past twenty-odd years, there appears to be little correlation between these reductions and similar reductions by other states, or for non-nuclear powers to forego acquiring a nuclear capability. In some cases reductions in the U.S. nuclear arsenal may actually stimulate nuclear armaments.

Would a reduction in U.S. nuclear forces serve to discourage the use of nuclear weapons?

When asked about the consequences of a nuclear-armed Iran, Hubert Vedrine, France’s Foreign Minister from 1997-2002, declared:

Jacques Chirac said things that many experts are saying around the world, even in the United States. That is to say, that *a country that possesses the bomb does not use it and automatically enters the system of deterrence and doesn’t take absurd risks.*²⁶ [Emphasis added]

Vedrine’s view is a reassuring one. It implies that nuclear weapons are good for deterrence, and deterrence only, and that this logic is universal: once a state acquires nuclear weapons it enters a “deterrence system” which appears to be quite stable, as none of its members take “absurd risks.” His view seems to suggest that the number of nuclear weapons a state possesses is not particularly important, either in terms of enabling deterrence or promoting rational behavior (i.e., avoiding “absurd risks”).

If Vedrine’s view is correct, then it may be possible to effect substantial reductions in U.S. nuclear forces beyond those called for in New START. Regrettably, this perspective does not pass close inspection, for the following reasons.

²⁵ Russia’s concerns appear to be concentrated on NATO (the U.S. specifically) and China, while Pakistan must account for India’s advantage in conventional forces.

²⁶ Elaine Sciolino, “Chirac’s Iran Gaffe Reveals a Strategy: Containment,” *New York Times*, February 3, 2007, p. A8.

Nuclear weapons have utility beyond deterrence of nuclear use

Several states that view nuclear weapons as a means of offsetting their conventional inferiority have adopted military doctrines calling for the use of nuclear weapons under circumstances other than in response to a nuclear attack on their homeland. Two of particular note are Pakistan and Russia.

Russia's military doctrine calls upon nuclear weapons to support two objectives.²⁷ One involves employing nuclear weapons to deter a nuclear attack on the homeland through the threat of a devastating retaliatory strike upon the aggressor. The second centers on the limited employment of nuclear weapons, both to demonstrate resolve and to terminate a conventional war in which the balance has shifted against Russia.²⁸

Russia is backing up its words with action. Since 1999, the Russians have "employed" very-low-yield nuclear weapons in large-scale military exercises.²⁹ In their Zapad-1999 (West-1999) exercise the Russian military, in responding to a NATO attack on the Kaliningrad oblast, conducted limited nuclear strikes with four air-launched cruise missiles.³⁰ More recently, in Vostok-2010 (East-2010) in eastern Russia—the largest military exercise in post-Soviet history—two live launches of nuclear-capable Tochka-U (SS-21) missiles were executed against the command post of a "hypothetical opponent."³¹ The Russians apparently believe that their large strategic nuclear forces will deter the opponent from responding in kind, and seek to employ "tactical" nuclear weapons if necessary to terminate a conflict on conditions acceptable to Moscow.

With respect to Pakistan,³² the principal roles of Pakistan's nuclear arsenal have been to deter the use of nuclear weapons against its territory, deter a military invasion by India's superior conventional forces, and ensure that any conventional conflict that does occur does not result in a ruinous defeat.³³ To enhance deterrence Islamabad has resisted any

²⁷ I am indebted to my colleague, Barry D. Watts, for these observations regarding Russia's nuclear doctrine and associated field exercises.

²⁸ Dima Adamsky, "Russian Regional Nuclear Developments," *Long Term Strategy Group* (LTSG), September 2010, p. 20 (italics in the original). See also Mark Schneider, "The Nuclear Forces and Doctrine of the Russian Federation," *National Institute Press*, publication No. 0003, 2006; and Stephen J. Blank, ed., *Russian Nuclear Weapons: Past, Present, and Future* (Carlisle, PA: Strategic Studies Institute, November 2011).

²⁹ Miriam John and Joseph Braddock, "The Nuclear Weapons Effects National Enterprise," Defense Science Board/Threat Reduction Advisory Committee, June 2010, pp. 8-9.

³⁰ Nikolai N. Sokov "The Evolving Role of Nuclear Weapons in Russia's Security Policy," in Cristina Hansell and William C. Potter, eds., *Engaging China and Russia on Nuclear Disarmament* (Monterey, CA: Center for Nonproliferation Studies, April 2009), p. 78; and Gunnar Arbman and Charles Thornton, "Russia's Tactical Nuclear Weapons: Part I: Background and Policy Issues," FOI-R—1057—SE, November 2003, pp. 29-30.

³¹ Roger McDermott, "Reflections on Vostok 2010: Selling an Image," *Eurasia Daily Monitor*, 7, Issue 134, July 13, 2010, available at http://www.jamestown.org/single/?no_cache=1&tx_ttnews%5Btt_news%5D=36614, accessed on March 3, 2012.

³² This discussion of Pakistan's nuclear doctrine is drawn from the research of two of my CSBA colleagues, Ambassador Eric Edelman and Dr. Evan Braden Montgomery.

³³ Peter Lavoy, "Islamabad's Nuclear Posture: Its Premises and Implementation," in Henry D. Sokolski, ed., *Pakistan's Nuclear Future: Worries Beyond War* (Carlisle: Strategic Studies Institute, 2008), p. 134; and

declaration of its nuclear “redlines.” Moreover, it has also refused to join India in a “no-first-use” pledge.

The best elaboration of Pakistani nuclear policy and doctrine may have come from Lieutenant General (Ret.) Khalid Kidwai, head of the Pakistani military’s Strategic Plans Division—the organization responsible for overseeing, coordinating, and protecting the nation’s nuclear arsenal. LTG Kidwai declared that Pakistan would resort to nuclear weapons use under four conditions: (1) if India conquered a large portion of Pakistan’s territory; (2) if India destroyed a large portion of Pakistan’s air or ground forces; (3) if India attempted to economically strangle Pakistan, for instance by implementing a maritime blockade of its key ports at Gwadar and Karachi; and (4) if India destabilized Pakistan politically or was responsible for instigating a large-scale domestic uprising.³⁴ The general might have included a fifth circumstance: Indian attacks on Pakistan’s nuclear forces.

Pakistan has also left considerable ambiguity with regard to how it would employ its nuclear weapons.³⁵ It appears, however, that Pakistan is lowering the barriers to nuclear use. The prospect that its conventional forces might be overrun quickly is placing considerable pressure on Islamabad to use its nuclear weapons shortly after a conflict breaks out. As Scott Sagan explains

The strategic logic of Pakistan’s weaker conventional balance and subsequent first-use doctrine would lead one to predict that limited nuclear war options exist both to provide a more credible deterrent threat against Indian conventional operations and to provide less than massive, and some would say suicidal, options to the Pakistani leadership in the event of a major conventional war Pakistan is losing.³⁶

In summary, at least two major nuclear powers have military doctrines that call for the use of nuclear weapons against conventional aggression. Given the objectives outlined above for the U.S. nuclear deterrent, one would want to know how it might play a role in deterring such use, or in arresting it should it occur. Until problems like this have been thoroughly vetted it is difficult to say whether substantial further reductions in the U.S. arsenal represent a wise course of action.

Peter Lavoy, “Pakistan’s Nuclear Doctrine,” in Rafiq Dossani and Henry S. Rowen, *Prospects for Peace in South Asia* (Stanford: Stanford University Press, 2005), p. 284.

³⁴ Paolo Cotta-Ramusino and Maurizio Martellini, “Nuclear safety, nuclear stability and nuclear strategy in Pakistan,” *Landau Network—Centro Volta* (January 2002), <http://www.centrovolta.it/landau/content/binary/pakistan%20Januray%202002.pdf>.

³⁵ Some analysts, for instance, maintain that Pakistan would strike a mixture of Indian civilian and military targets. Others assert that Pakistani nuclear strikes would be limited solely to counter-value targets. Peter Lavoy, “Islamabad’s Nuclear Posture: Its Premises and Implementation,” in Henry D. Sokolski, ed., *Pakistan’s Nuclear Future: Worries Beyond War* (Carlisle, PA: Strategic Studies Institute, 2008), p. 139; Zafar Iqbal Cheema, “Pakistan’s Nuclear Use Doctrine and Command and Control,” in *Planning the Unthinkable, How New Powers will Use Nuclear, Biological, and Chemical Weapons* (Ithaca, NY: Cornell University Press, 2000), p. 179; Gregory S. Jones, “Pakistan’s ‘Minimum Deterrent’ Nuclear Force Requirements,” in *Pakistan’s Nuclear Future*, pp. 90-91; and “A.H. Nayyar and Zia Mian, “The Limited Military Utility of Pakistan’s Battle-Field Use of Nuclear Weapons in Response to Large-Scale Indian Conventional Attack,” *Pakistan Security Research Unit*, Brief No. 61.

³⁶ Scott D. Sagan, “The Evolution of Pakistani and Indian Nuclear Doctrine,” in Sagan, ed., *Inside Nuclear South Asia* (Stanford: Stanford University Press, 2009), p. 234.

Not all decision-makers who control nuclear weapons may be rational, or rational according to the ways we calculate cost, benefit and risk

M. Vedrine argues that no rational person would consciously decide to employ nuclear weapons because (one assumes) of the potential horrific consequences that might ensue. The problem with his assertion is that there are leaders who are not rational—at least not in the way that leaders of nuclear-armed, Western, democratic states are rational.

The history of the last century is replete with examples of leaders taking what many considered to be “absurd risks,” but which might better be termed examples of the leaders of rival states failing to assess the intentions of one another correctly. In the period leading up to World War II, British Prime Minister Neville Chamberlain believed his counterpart, German dictator Adolf Hitler, could be negotiated with in good faith over Czechoslovakia. Hitler’s threat to go to war over Czechoslovakia was considered so great a risk that his generals plotted a coup against him in the event he gave the order to go forward.³⁷ For his part, Hitler apparently believed that neither Great Britain nor France would go to war over his invasion of Poland in September 1939.³⁸ Both assumptions proved wrong, with enormous consequences for the world. Later, despite being at war with the British Empire, in a period of less than six months in 1941 Hitler took the “absurd risk” of going to war against both the Soviet Union and the United States, the world’s two emerging superpowers—decisions that ultimately led to his demise. Toward the end of the war Hitler went so far as to order *the destruction of his own country*.³⁹

During the Cuban Missile Crisis, the Cuban dictator Fidel Castro took the suicidal risk of urging his Soviet counterpart, Nikita Khrushchev, to attack the United States with nuclear weapons if U.S. conventional forces attacked Cuba, even though Cuba was certain to be obliterated in a U.S. nuclear counterstrike. Castro clearly viewed the world very differently in this respect than his rival in the White House, President John Kennedy or, thankfully, Khrushchev. According to those who knew him, Castro “had the messianic ambition of a man selected by history for a unique mission” one who valued national *dignidad* (“dignity, or “honor”) above survival. A Cuban newspaper editor who observed Castro during his early days in power felt that “Fidel gets his kicks from war and high tension.”⁴⁰

For their part the Americans were totally surprised by Khrushchev’s gambit. Even as the Soviet deployment was underway a CIA National Intelligence Estimate (NIE) concluded “the establishment on Cuban soil of Soviet nuclear striking forces which could be used against the U.S. would be incompatible with Soviet policy as we presently estimate it.” Indeed, Khrushchev took what Vedrine might term an “absurd risk” in the first place by covertly deploying nuclear weapons to Cuba, less than 100 miles from the United States.

³⁷ Fortunately for Hitler, but not for humanity, the western powers caved in to Germany’s demands at the Munich Conference in September 1938.

³⁸ Alan Bullock, *Hitler and Stalin* (New York, Alfred A. Knopf, 1992), p. 631.

³⁹ On March 19, 1945, Hitler issued a directive ordering the destruction of all of Germany’s industrial, transportation and communications infrastructure, as well as all food stores. Germany was to be made one vast wasteland. William L. Shirer, *The Rise and Fall of the Third Reich* (New York: Simon & Schuster, 1959), pp. 1104-05. Fortunately, Hitler’s order required the cooperation of many more people than would have been needed if he had had nuclear weapons at his disposal. Fortunately key German leaders did not carry out the order, and the German nation was spared even greater misery.

⁴⁰ Michael Dobbs, *One Minute to Midnight* (New York: Alfred A. Knopf, 2008), pp. 76, 103.

Expecting the Soviet leader who, according to a close colleague, had “enough emotion for ten people—at least” to respect U.S. warnings against deploying Soviet offensive weapons in Cuba, Kennedy concluded his rival acted outside the bounds of acceptable diplomatic behavior, like “an immoral gangster . . . not a statesman, not as a person with a sense of responsibility.” Kennedy also began questioning his own credibility—whether Khrushchev really understood him either, and concluded the Soviet leader thought, “I’m inexperienced. Probably thinks I’m stupid. Maybe most important, he thinks that I had no guts.”⁴¹

For his part, Khrushchev’s views of the situation varied widely, at times from moment to moment. When Kennedy ordered U.S. forces to DEFCON-2,⁴² a Soviet deputy foreign minister told colleagues that Khrushchev “s--t in his pants.” Yet at another point Khrushchev believed

the Americans have chickened out. It seems that Kennedy went to sleep with a wooden knife They say that when someone goes bear hunting for the first time, he takes a wooden knife with him, so it is easier to clean his pants.⁴³

Khrushchev’s calculation of costs, benefits and risks appears to have been changing, perhaps dramatically, from one moment to the next along with his moods.

There are, alas, many examples of leaders taking “absurd risks,” or not acting in a way American leaders would expect them to—perhaps because they believe Americans would not act that way. There is still bewilderment over Saddam Hussein’s decision to take on a U.S.-led military coalition not once, but twice.⁴⁴ At the same time, Saddam Hussein’s perception of the United States and its leaders was deeply flawed. According to Major General Wafiq al Sammarai, former head of Iraqi military intelligence,

Saddam [before the 1991 Gulf War] thought any reprisals would be limited and would tail off with time. He thought that America’s involvement in Vietnam had badly damaged its willingness to use military power. Vietnam had been an outright defeat, militarily and politically.⁴⁵

⁴¹ Michael Dobbs, *One Minute to Midnight* (New York: Alfred A. Knopf, 2008), pp. 7-8, 33, 123. Andrei Gromyko, the Soviet foreign minister, is the close colleague who remarked on Khrushchev’s personality. Kennedy’s initial response to the situation shows how temporal factors can greatly influence decision-making. Although the president eventually negotiated the withdrawal of Soviet missiles, his initial inclination was “We’re going to take out those missiles.”

⁴² A defense readiness condition (DEFCON) is an alert posture used by the United States armed forces, ranging from peacetime readiness (DEFCON-5) to general war (DEFCON-1). The first and only time U.S. forces were raised to DEFCON-2 was during the Cuban Missile Crisis. U.S. forces have been called to DEFCON-3 on only two occasions, during the 1973 Yom Kippur War and during the September 2011 terrorist attacks on New York and Washington. Joint Chiefs of Staff, *Joint Publication 1-02, Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: US Joint Chiefs of Staff, November 8, 2010), as amended through December 31, 2010, p. 100.

⁴³ Khrushchev’s point was that first-time bear hunters were more afraid of the bear than the bear was of them. Thus upon seeing a bear, they would soil their pants, which could be more easily “cleaned” with a dull wooden, as opposed to a sharp metal, knife. Dobbs, *One Minute to Midnight*, p. 112.

⁴⁴ See Keith B. Payne, *The Fallacies of Cold War Deterrence* (Lexington, KY: The University Press of Kentucky, 2001).

⁴⁵ Quoted in “Frontline: The Gulf War,” *Frontline Show #1407T*, PBS, Air Date: January 28, 1997, http://www.pbs.org/wgbh/pages/frontline/gulf/script_a.html

In summary, history suggests that, given the stakes involved when it comes to nuclear weapons American political leaders should not assume that leaders of other nuclear-armed states will avoid taking what are perceived as “absurd risks.” That is to say, we should not assume that they will view the world in the same way that we do, or that they will calculate costs, benefits and risks in the same way that we do, or that they will act “rationally.” These cautions were well understood during the Cold War: consequently, a great deal of talent and resources was devoted to understand how nuclear-armed states and their leaders calculated cost, benefit and risk with respect to the military balance in general and nuclear weapons in particular.

Structural instability

There may be instances where two nuclear rivals very much desire to avoid the use of nuclear weapons, where both do not want to take such “absurd risks.” We might assume that, under such circumstances, the use of nuclear weapons would not occur. Yet history suggests that the risks of nuclear use, even under these circumstances, cannot only be present, but uncomfortably high.

Consider the case of the United States and the Soviet Union during the Cold War. We now know that both countries came frighteningly close to the precipice on several occasions, despite the desire of leaders on both sides to avoid nuclear use. The most famous case, of course, is the Cuban Missile Crisis of October 1962. The other case occurred in the early 1980s.

At that time changes in U.S. nuclear strike options were made to target Soviet leaders themselves. Washington’s objective was to enhance deterrence by convincing the Kremlin that its regime could not survive a nuclear exchange with the United States. The United States was also planning to deploy Pershing II nuclear-armed ballistic missiles to Europe in response to the Soviet Union’s decision to field comparable SS-20 missiles. Collectively the change in U.S. nuclear targeting, the Pershing IIs’ short flight times and the Soviet Union’s problematic early warning system led the Kremlin leaders to believe they might be subjected to a surprise U.S. nuclear “decapitation” attack. Soviet leaders feared that a surprise U.S. first strike would destroy the radio and cable systems used to transmit orders to their nuclear forces, either directly or indirectly through the use of electromagnetic pulse (EMP) attacks.

Consequently they considered an option, known as the Dead Hand, that would enable a nuclear retaliatory strike in the event that all senior political decision makers and the military command structure were incapacitated. Dead Hand envisioned computers receiving nuclear attack warning data, riding out any attack and then, if they failed to receive any instructions, ordering an automated nuclear retaliatory strike.⁴⁶ The concept shared much with the “Doomsday Machine” depicted in the motion picture “Dr. Strangelove.”⁴⁷ Fortunately “only” a modified version of the system was fielded in which

⁴⁶ David E. Hoffman, *The Dead Hand*, (New York: Anchor, 2010), p. 152.

⁴⁷ Herman Kahn reportedly outlined the idea of a “Doomsday Machine” in the 1950s. The machine would have a computer linked to an arsenal of nuclear weapons. In the event of a nuclear attack, sensors would pass the information to the computer, which would be programmed to order all the doomsday weapons to detonate, irradiating the planet in a lethal radioactive nuclear fallout shroud that would extinguish all human life. The doomsday machine could be seen as the ultimate deterrent to an attack, since the computer would automatically issue the order to detonate without human intervention, effectively discouraging efforts by an

the decision to launch would be made by a small cadre of officers in a deep underground command center.

That system, known as Perimeter, was tested in November 1984 and became operational a few months later. Soviet policy called for ballistic missiles placed in super-hardened silos to be launched quickly upon alert of an attack by staff officers in a deeply buried military command center. These missiles would give the order to all remaining Soviet missiles to launch their attack on the United States. Oddly enough, the Soviets never informed the Americans about Perimeter, even though its purpose was primarily to deter a U.S. nuclear attack.⁴⁸

A similar situation could occur if Iran acquires a nuclear capability.

Considering its inability to absorb even a limited nuclear attack of a half dozen or so warheads and the limitations of ballistic missile defenses, Israel can be expected to attempt to maintain the option of executing a decisive, nuclear pre-emptive attack against Iran's nuclear arsenal if it believes an attack is imminent. Israeli leaders recognize that a first strike against Iran would likely be met with universal condemnation from the international community. However, Israel has weathered such criticism before. Moreover, given the stakes involved in failing to preempt—the survival of the state of Israel—the costs of failing to order a first strike would likely be viewed as far exceeding the benefits of exercising restraint. Accordingly, Israeli decision makers will have strong incentives to pursue a counterforce capability in addition to a countervalue (“assured destruction”) capability. Yet Iran's mobile missile launchers would very likely present significant challenges to Israeli efforts at counterforce targeting. As Iran's missile forces continue to grow, and its nuclear arsenal increases, Israel's problem will only become more difficult.⁴⁹

Another worrisome consequence of this competitive dynamic is the short warning times each will have in the event of a ballistic missile attack, similar to the problem faced by Soviet leaders when confronted with U.S. deployment of Pershing II missiles to Europe. This will almost certainly pressure both sides to adopt a heightened alert status—Iran to preserve the option of launching a decisive first strike, and Iran to avoid becoming the victim of such an attack. Yet the cost of fielding early warning and command and control systems that would be required will be very costly, perhaps prohibitively so. To the extent that either side seeks to resolve the problem by placing its forces on hair-trigger alert or extending nuclear release authority to lower commands, such a posture would not only be costly but also potentially destabilizing, as the risk of accidental launch or miscalculation would inevitably increase, especially during crises.

Over time geographic proximity, growing nuclear arsenals and related advances in technology⁵⁰ that enable disarming first strikes against a rival's nuclear forces could

enemy to launch a sneak attack to destroy the opposing country's nuclear forces before they could retaliate.

⁴⁸ David E. Hoffman, *The Dead Hand*, (New York: Anchor, 2010), pp. 124, 149, 153-54. Ironically, the Soviets in “Dr. Strangelove” also failed to inform the Americans of their “Doomsday Machine.”

⁴⁹ Cordesman and Seitz, *Iranian Weapons of Mass Destruction: Doctrine, Policy and Command* (Washington, DC: Center for Strategic and International Studies, January 12, 2009), p. 314.

⁵⁰ As occurred during the Cold War, certain advances in military technology—for example, the miniaturization of nuclear warheads that enabled them to be deployed on ballistic missiles, major improvements in missile guidance, etc.—enabled the side possessing them to seriously contemplate

create a highly unstable nuclear balance between Israel and Iran. Under such circumstances—the very way in which the nuclear competition is structured—even leaders who desire to avoid “absurd risks” could find themselves compelled to take them.

An “N-Player” Competition

Depending on the size of additional reductions in the U.S. nuclear arsenal, the United States will find itself in a multipolar nuclear world. This will occur either because its arsenal has been reduced to a size comparable to countries like China, Pakistan and others, or because U.S. levels are sufficiently low as to encourage minor nuclear powers to expand their arsenals to achieve “great nuclear power” status. While a great deal of thought was given during the Cold War by some of the world’s best strategic thinkers as to the character of a competition between two nuclear-armed states, comparatively little thought has been given to the characteristics of an “n-player” nuclear competition.

Some who advocate major further reductions in the U.S. nuclear arsenal assert that other countries could be drawn into negotiations that would find all nuclear powers paring down their arsenals until these weapons are eliminated from the earth.⁵¹ This raises the question as to whether a world comprising a half dozen or so nuclear powers, all possessing an equal number of nuclear weapons, is likely to reduce the chances of nuclear weapons use and serve U.S. security interests more broadly.

In a multipolar nuclear world, many of the conditions that contributed to “stability” during the bipolar U.S.-Soviet Cold War nuclear competition would no longer obtain. For example, in contrast with the nuclear competition during the Cold War, “parity”—having a comparable nuclear capability with that of your existing or prospective rival(s)—is not an option for each state engaged in an n-player competition. It is also difficult to see how all players would have the resources to establish an “assured destruction” capability, another Cold War desideratum. Consider a thought experiment. Five nuclear-armed regional powers each possess 200 nuclear weapons as they travel along the road to nuclear weapons elimination. If these five powers are all allies or partners, the situation is likely to be stable. Such a condition would also be exceedingly rare, in that history offers very few examples of five comparable powers all existing in harmony.

Let us assume, therefore, that the historical norm prevails, and that there is some level of competition among these states, such that there are some formal and informal alignments, as there were in late 19th and early 20th century Europe. Then France and Russia were aligned with one another, as were Germany and Austria-Hungary. Britain leaned toward the former powers while the Ottoman Empire tilted toward the latter. Italy was aligned on paper with Germany and Austria-Hungary, but ended up siding with France and Russia.

disarming its rival’s nuclear forces in a first-strike counterforce attack. These military technologies have long since been mastered by a number of states and could destabilize the balance between emerging nuclear powers, such as India and Pakistan.

⁵¹ See, for example, Gen. (Ret.) James Cartwright, Amb. Richard Burt, Sen. Chuck Hagel, Amb. Thomas Pickering, Gen. (Ret.) Jack Sheehan, and Dr. Bruce Blair (Study Director), “Modernizing U.S. Nuclear Strategy, Force Structure and Posture,” *Global Zero U.S. Nuclear Policy Commission*, 2012, pp. 3-4. Thomas Schelling has addressed the issue of whether the “abolition” of nuclear weapons throughout the globe would actually reduce the odds of their use, and I cannot improve upon his work in my testimony. Thomas C. Schelling, “A World Without Nuclear Weapons?” *Daedalus*, Fall 2009.

In brief, the system was neither highly dynamic nor rigidly static—the predominant characteristic of the international system in the modern (post-Treaty of Westphalia) era.

For our purposes, let's say the five powers are the United States, Russia, China, India and Pakistan. Again, each has 200 weapons. The only strongly democratic states in the group are the United States and India. Pakistan is a "wild card." While it has recently had strong ties to the United States, one could easily imagine it drifting closer to China (a key sponsor of its nuclear program). It is plausible that the United States would have to rely on its nuclear force of 200 weapons to account for between 400 and 600 weapons of China, Russia and Pakistan, to include extending a nuclear umbrella of extended deterrence to other countries such as Japan and Germany, concerned over the smaller nuclear forces of North Korea and Iran, respectively. Would the United States and the countries to which it has extended nuclear security guarantees be more secure under such an arrangement than they are today?⁵²

Summary

The theme of my testimony is that while there appears to be general agreement on basic U.S. security objectives when it comes to nuclear weapons, there is considerable divergence of opinion with regard to how best to achieve these objectives. As to the issue of undertaking substantial further reductions, it appears there are a number of important issues that have yet to be addressed before we can confidently conclude that the benefits of such a course of action outweigh the risks. I have tried to identify some of them in my testimony.

As we move into what some have described as a Second Nuclear Age⁵³ it would be wise to follow the examples set by administrations early in the "First Nuclear Age"—the Truman and Eisenhower administrations, in particular. These administrations engaged some of our nation's finest strategic thinkers to ensure that they had thought through, as best they could, the enormous consequences of making the right decisions regarding our nuclear force posture.

⁵² Some have argued that the United States can rely upon its precision-guided weaponry, which they assert can "hold at risk nearly the entire spectrum of potential targets" now reserved for nuclear weapons. See, for example, Gen. (Ret.) James Cartwright, Amb. Richard Burt, Sen. Chuck Hagel, Amb. Thomas Pickering, Gen. (Ret.) Jack Sheehan, and Dr. Bruce Blair (Study Director), "Modernizing U.S. Nuclear Strategy, Force Structure and Posture," *Global Zero U.S. Nuclear Policy Commission*, 2012, p. 2. This seems dubious. Consider, for example, hardened land-based missile shelters, or deep underground facilities. Rivals confronted with the prospect of having to address only the threat from conventional munitions, no matter how accurate, will look to offset their value by pursuing counters such as these. There is also the matter of yield. While in theory enormous numbers of precision-guided munitions would be able to produce an equivalent level of prompt destruction on a city, in practice the cost of doing so would be enormous, both in terms of the weapons and the delivery systems.

⁵³ See, for example, Fred Charles Ikle, "The Second Coming of the Nuclear Age," *Foreign Affairs*, January/February 1996; and Paul Bracken, "The Second Nuclear Age," *Foreign Affairs*, January/February 2000; and Paul Bracken, *The Second Nuclear Age: Strategy, Danger, and the New Power Politics* (New York: Henry Holt, 2012).

Dr. Andrew F. Krepinevich, Jr. is President of the Center for Strategic and Budgetary Assessments. He assumed this position in 1993, following a 21-year career in the U.S. Army.

Dr. Krepinevich's has served in the Department of Defense's Office of Net Assessment, and on the personal staff of three secretaries of defense. He has also served as a member of the National Defense Panel, the Defense Science Board Task Force on Joint Experimentation, the Joint Forces Command Advisory Board, and the Defense Policy Board. He currently serves on the Chief of Naval Operations' (CNO's) Advisory Board and on the Army Special Operations Command's Advisory Board.

Dr. Krepinevich frequently contributes to print and broadcast media. He has lectured before a wide range of professional and academic audiences, and has served as a consultant on military affairs for many senior government officials, including several secretaries of defense, the CIA's National Intelligence Council, and all four military services. He has testified frequently before Congress. Dr. Krepinevich has taught on the faculties of West Point, George Mason University, Johns Hopkins University's School of Advanced International Studies, and Georgetown University.

Dr. Krepinevich's most recent book is *7 Deadly Scenarios: A Military Futurist Explores War in the 21st Century*. His other recent works include *Strategy in a Time of Austerity: Why the Pentagon Should Focus on Assuring Access*; *The Dangers of a Nuclear Iran*; and *The Pentagon's Wasting Assets*, published in *Foreign Affairs*; and CSBA monographs: *Cyber Warfare: A "Nuclear Option"?*; *Strategy in Austerity*; *AirSea Battle: A Point-of-Departure Operational Concept* (co-author); and *The Road Ahead* (co-author). Dr. Krepinevich received the 1987 Furniss Award for his book, *The Army and Vietnam*.

A graduate of West Point, Dr. Krepinevich holds an M.P.A. and Ph.D. from Harvard University. He is a member of the Council on Foreign Relations.

**DISCLOSURE FORM FOR WITNESSES
CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 113th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Committee on Armed Services in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

Witness name: Dr. Andrew Krepinevich

Capacity in which appearing: (check one)

☐ Individual

☒ Representative

If appearing in a representative capacity, name of the company, association or other entity being represented: Center for Strategic and Budgetary Assessments

FISCAL YEAR 2013

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
WHS	DOD/ONA	\$1,200,000	Assessments/analyses, wargames, and briefings on international security/economics
DLA Acquisition Directorate	National Defense University	\$84,000	Secretary of Defense Corporate Fellows Program Orientation

FISCAL YEAR 2012

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
WHS	DOD/ONA	\$1,800,000	Assessments/analyses, wargames, and briefings on international security/economics
DLA Acquisition Directorate	National Defense University	\$80,000	Secretary of Defense Corporate Fellows Orientation
CTTSO SETA	OASD (SO/LIC)	\$551,000	Future requirements and visioning

FISCAL YEAR 2011

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
WHS	DOD/ONA	\$2,300,000	Assessment/analysis, wargames, and briefings on international security/terrorism
DARPA/Strategic Assessments	DARPA	\$95,000	Crisis simulation exercise in national security decision making environment
DLA Acquisition Directorate	National Defense University	\$75,000	Secretary of Defense Corporate Fellows Program Orientation

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2013): 2 ;
 Fiscal year 2012: 2 ;
 Fiscal year 2011: 3 ;

Federal agencies with which federal contracts are held:

Current fiscal year (2013): 2 ;
 Fiscal year 2012: 2 ;
 Fiscal year 2011: 3 ;

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2013): Research and analysis ;
 Fiscal year 2012: Research and analysis ;
 Fiscal year 2011: Research and analysis ;

Aggregate dollar value of federal contracts held:

Current fiscal year (2013): \$1,284,000 ;
 Fiscal year 2012: \$2,431,000 ;
 Fiscal year 2011: \$2,470,000 ;

Federal Grant Information: If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2013): _____;

Fiscal year 2012: _____;

Fiscal year 2011: _____.

Federal agencies with which federal grants are held:

Current fiscal year (2013): _____;

Fiscal year 2012: _____;

Fiscal year 2011: _____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2013): _____;

Fiscal year 2012: _____;

Fiscal year 2011: _____.

Aggregate dollar value of federal grants held:

Current fiscal year (2013): _____;

Fiscal year 2012: _____;

Fiscal year 2011: _____.

BENEFITS AND RISKS OF CONTINUING U.S. NUCLEAR REDUCTIONS

Dr. Bruce G. Blair

Testimony to the House Armed Services Committee

Subcommittee on Strategic Forces

March 19, 2013

Congressman Rogers, Congressman Cooper and other distinguished members, it's an honor and a pleasure to present testimony before this committee. Thank you for inviting me.

For purposes of transparency on the matter of conflict of interest, I want to report that in all my professional life outside of U.S. government employment, I have never accepted any government or corporate funding for any of my research, analysis, or publications.

My bottom-line judgment is that continuing U.S. nuclear reductions, even cuts deeper than expected in the next phase, would produce substantial benefits and carry no risks.

In the May 2012 Global Zero Commission report issued by Gen. (ret.) James Cartwright and others including Senator Chuck Hagel, a force consisting of 900 total U.S. nuclear weapons in ten years down the road – an 80 percent reduction

from the current U.S. stockpile -- was deemed more than adequate to meet strategic requirements.¹

A force of this size could support extensive counterforce as well as countervalue operations. As Gen. (ret.) Cartwright puts it: "It would not be a small nor humble force designed for minimal deterrence, it would not entail a radical shift in targeting philosophy away from military targets to population centers, and it is not a city-busting strategy. On the contrary, it would hold at risk all the major categories of facilities in all countries of interest to include the diverse sets of nuclear/WMD forces and facilities, top military and political leadership, and war-supporting industry. It would fulfill reasonable requirements of deterrence vis-à-vis every country considered to pose a potential WMD threat to the United States."

If this 900-weapon arsenal were assigned targets according to Cold War targeting principles, the following illustrative categories of targets and warhead assignments would be possible: Russia: WMD (325 warheads including 2-on-1 strikes against every missile silo), leadership command posts (110 warheads), war-supporting industry (136 warheads). Moscow alone would be covered by eighty (80) warheads. China: WMD (85 warheads including 2-on-1 strikes against every missile silo), leadership command posts (33 warheads), war-supporting industry (136 warheads). North Korea, Iran, and Syria: Each country would be covered by forty (40) warheads.

These numbers substantially exceed the self-reported number of nuclear explosions on urban centers and high-level command posts that would effectively deter the only nations (Russia and China) possessing nuclear arsenals that technically pose existential threats to the United States. According to a former senior general in the Russian strategic forces, U.S. nuclear retaliation against only a handful of Russian cities would cross the threshold of unacceptable damage in the

¹ *Global Zero Nuclear Policy Commission Report: Modernizing U.S. Nuclear Strategy, Force Structure, and Posture*, May 2012. http://www.globalzero.org/files/gz_us_nuclear_policy_commission_report.pdf

view of Russia's top political and military leadership. U.S. retaliatory capability would be orders of magnitude greater than this. He also reported that a U.S. strike by 110 warheads on the major Russian command posts would pose a decapitation threat that would effectively underwrite deterrence from a military standpoint.

Also, an arsenal of 900 U.S. weapons would vastly exceed the size of the nuclear arsenals fielded by America's actual contemporary adversaries (namely, North Korea with less than 12 weapons; Iran with zero; Syria with zero).

In short, although an arsenal of 900 total weapons would represent a whopping eighty (80) percent reduction from today's level, it would still possess enormous destructive power, far more than necessary to impress any potential rational foe. For the irrational foe, such as fanatical terrorists, the level of American nuclear armaments would make no difference at all. Our tool of choice to deal with suicidal terrorists is special operations forces, not nukes.

Why are such deep cuts possible, and what are the benefits?

First and foremost, twenty-five years after the end of the Cold War, the need for large nuclear arsenals has greatly diminished. Mutual assured destruction (MAD) is no longer the cornerstone of U.S.-Russian geo-strategic and political relations. The requirements of deterrence are obviously much lower between countries that are no longer enemies and that no longer believe either side intends to attack the other.

The two sides continue to target each other in the comprehensive technical manner described earlier, but the decline of mutual nuclear threat in our primary relationship has enabled our two countries to achieve unprecedented levels of cooperation and mutual benefits in a multitude of areas ranging from sanctioning Iran and North Korea for their nuclear transgressions, to securing 'loose nukes' in Russia, to enabling NATO supplies to travel overland through Russia to

Afghanistan. It has also enabled the former nuclear adversaries to cut their nuclear stockpiles by seventy-five (75) percent since the Cold War's end. However, the legacy arsenals are still very large and redundant. There exists ample room for further cuts.

Second, reducing nuclear stockpiles feeds on itself in a positive way. As both sides reduce their nuclear arms, nuclear-related targets go away along with the need to hold them at risk. Weapons previously aimed at those targets lose their mission and retire, and once these weapons are de-commissioned the weapons aimed at them by the other side lose their reason for existence.

This positive, self-amplifying feedback loop has resulted in massive reductions in weapons and targets and greatly undercut the rationale for new weapons. In the mid-1980s, the U.S. and the Soviet Union had some 65,000 nuclear weapons between them, and the U.S. strategic war plan consisted of 16,000 targets in the Soviet bloc, mostly nuclear-related targets.² Today we and the Russians have about 16,000 weapons between us, some 3,000 of which are actively deployed. I estimate that U.S. strategic forces are aimed at about 1,000 Russian (and 500 Chinese) targets. In other words, we and the Russians have reduced our stockpiles by about 75 percent, and the U.S. has reduced its nuclear targets by about 90 percent. This is no coincidence. It represents the result of a mutually reinforcing dynamic interaction that has reversed the nuclear arms race, saved both sides a big bundle of money, and put us on the path of Global Zero, which at some point down the road could potentially save the United States the \$30 billion annual tab we spend on nukes. Cuts down to 900 total weapons on both the U.S. and Russian side by the year 2022 could save us about \$120 billion over the next 15-20 years.

² The dubious wisdom of this scale of nuclear profligacy, not to mention the hair-trigger posture adopted, the failure to provide for survivable nuclear command-control-communications, and the extensive pre-delegation of nuclear release authority distributed to U.S. military commanders during the Cold War, belies any notion that the First Nuclear Age was wisely guided by the nation's finest strategic thinkers.

Third, ‘smart targeting’ using fewer nuclear weapons supplemented by ‘smart’ conventional forces has made further nuclear cuts possible without sacrificing any target coverage. As a result of revolutionary advances in information collection and processing, global targeting has become more smart and efficient. For example, a few years ago our targeteers planned to expend ten (10) nuclear weapons on one high-value command post, but recent intelligence breakthroughs have enabled them to reduce that number to two (2). A few years ago they had to waste nukes on barraging vast expanses in which mobile missiles operate, but today they can pinpoint their locations and thus greatly shrink the barrage area.

At the same time, our conventional superiority has reduced our reliance on nukes and given the President more flexibility in responding to threats of all kinds, nuclear and non-nuclear alike. As the head of STRATCOM recently said in testimony to Congress: our “conventional forces do, in fact, make a difference in terms that we are no longer in a position where we have to threaten nuclear use in order to overcome a conventional deficiency... overwhelming, conventional power projection that we can bring to bear around the world has made a difference in the role of our nuclear deterrent....we have been able to narrow the role of that nuclear deterrent, accordingly.”³

This ‘smart targeting’ with nuclear or conventional forces, together with dramatic increases in special operations capabilities and cyber warfare, and to a lesser extent missile defenses, has allowed the United States to re-balance its deterrence and defense strategy to reduce reliance on nukes and shift to tools that are far more useable in conflict. This re-balancing adds more feasible options to the President’s kitbag of tools, increases our credibility in dealing with threats that previously required a nuclear response, and creates more room for further reductions in the U.S. nuclear stockpile.

³ Testimony of General Kehler, Senate Armed Services Committee Hearing, March 13, 2013.

Fourth, this re-balancing has also strengthened the credibility of extending deterrence to America's allies such as South Korea and Japan, whose military contributions to our alliances have also grown. For instance, South Korea needed help from U.S. tactical nuclear weapons to deal with North Korean artillery threats into the 1980s, but such use posed a serious danger of exposing Japan as well as South Korea to deadly radioactive fallout, and thus undermined the credibility of the nuclear option. Today, South Korea with U.S. support has conventional superiority over the North and the need for U.S. nukes for war-fighting on the Peninsula has greatly diminished.

The North's fledgling nuclear threat does revive somewhat the need to extend the U.S. nuclear umbrella over our allies in the region. However, our joint conventional general purpose forces combined with special operations, missile defenses, and cyber warfare also go a long way toward deterring and suppressing this emerging threat. Our alliance's kitbag is full of new non-nuclear tools. At any rate, the very low numbers of North Korean nuclear weapons do not alter the fact that America's vastly larger arsenal confers overwhelming nuclear superiority in America's favor, and even deep future cuts in the U.S. stockpile will not measurably erode that superiority. The same story goes for Iran and Syria, neither of which have any nuclear forces.

Fifth, the continuing reduction of U.S. nuclear arms presents opportunities for re-configuring the U.S. force structure, posture, and strategy in order to strengthen strategic stability and eliminate obsolete forces. The Global Zero report issued by Gen. (ret.) Cartwright calls eliminating the land-based U.S. Minuteman force and eliminating launch on warning from both sides day-to-day alert posture. In the view of the report's authors, these smaller and off-alert arsenals would reduce vulnerabilities and risks of accidental, mistaken, and unauthorized launch.

A key benefit of smart reductions is that cyber warfare threats can be mitigated. By eliminating forces that must be maintained on launch-ready alert for technical reasons – for instance, Minuteman forces would break down if they did not continuously operate their navigation gyroscopes in peacetime – and by eliminating reliance on ‘prompt launch’ to ensure the survivability of such forces, we can remove the danger that unauthorized actors could compromise command-control-communications and early warning networks and trigger a launch that was not intended, or block the execution of a legitimate order from the President. These kinds of cyber warfare threats are little understood, which is all the more reason to take nuclear missiles off of launch-ready alert. An early example was the discovery in the 1990s of an electronic back door to the Naval Broadcast network that could have been exploited by outside hackers to inject a launch order into the VLF (Very Low Frequency) radio network used to transmit launch directives from the Pentagon to Trident ballistic missile submarines on launch patrol. Needless to say, a control failure caused by cyber intrusion potentially could have catastrophic consequences.

Sixth, continuing reductions, even deep cuts, are not expected to stimulate China or other countries to ‘rush to parity’ with the United States. On the contrary, U.S.-Russian cuts would have the opposite effect insofar as they help draw China and others into a multilateral process that works to cap, freeze, proportionally reduce or otherwise constrain their nuclear arsenals.

In the case of China, Senator Lee in a recent hearing recently asked the head of STRATCOM “whether you believe that China will continue to increase its -- the number of weapons in its arsenal, and whether it's going to try to seek a level of equivalency with the United States and Russia in terms of nuclear weapons? General Kehler’s answered that “I do not see, nor has the intelligence community reported to me that they are seeking to have some kind of numeric parity with the United States or with Russia.”⁴

⁴ Senate Armed Services Committee Hearing, March 13, 2013.

The Global Zero report issued by Gen. (ret.) Cartwright judges that China's current small arsenal of approximately 150 total nuclear weapons reflects China's traditional policy of 'minimal deterrence'. This policy harks back to Mao Zedong's guidance a half century ago to deploy only a small nuclear arsenal. The Chinese military has adhered strictly to this time-honored doctrine. Based on extensive engagement with Chinese military and foreign policy officials and experts, I believe General Kehler's statement is firmly grounded. The Global Zero report authors projected modest growth in the Chinese arsenal – to perhaps 200-250 total weapons over the next ten years, and no more than 250-300 in the worst case. A much larger effort to 'rush to parity' with the United States appears to be very unlikely. In any event, such an effort would take many years, would be detectable, and would allow the U.S. to tailor or curtail further U.S. reductions as needed.

More importantly, the Global Zero report emphasizes the importance of China's future participation in nuclear arms control. The historical bilateral framework served its purpose but multilateral nuclear negotiations must be initiated soon to address effectively the multitude of nuclear risks and threats that lie outside the U.S.-Russian relationship. Most of these risks reside in South Asia, the Middle East, and Northeast Asia rather than on the arc between Russia and the United States.

It would be extremely beneficial if continuing reductions in the U.S. and Russian nuclear arsenals help bring China and the other nuclear weapons countries, including those outside the Non-Proliferation Treaty to the negotiating table. There are reasons to believe that China and some others would in fact join such multilateral talks, although there are some internal interests in these countries that oppose entering into a nuclear disarmament process. Thus we should not assume but rather test their willingness to join the process.

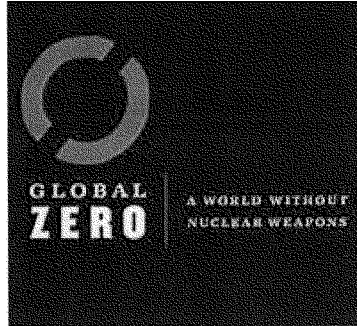
The Global Zero commissioners considered, and did not reject, the idea of linking deep cuts in U.S. and Russian arsenals to China's commitment to constrain its arsenal. The corollary benefit of such a commitment is of course that U.S. and Russia reductions could go even farther down the path of Global Zero – as long as the commitment can be codified and verified.

Seventh, continuing U.S. nuclear arms reductions, especially those taken in conjunction with Russia and other countries, would affirm U.S. support for the Non-Proliferation Treaty (NPT) which continues to be an indispensable tool in the international community's effort to prevent and roll back proliferation. The Article 6 obligation to pursue good faith negotiations for nuclear disarmament may have been "essentially hortatory" at one time, but today it is and must be taken seriously. Through nuclear arms reductions, the United States shows respect for the nuclear disarmament agenda endorsed by the vast majority of the treaty's 189 signatories, and in return the United States can expect them to stiffen their resolve in enforcing the NPT. The days of U.S. and Russian lip-service to the disarmament clause of the treaty are over if they hope to preserve and strengthen it in the face of growing proliferation pressures around the world. And the more the nuclear weapons countries reduce their nuclear stockpiles, the more determined to crack down on NPT violators they and the rest of the world will become.

Last, this hearing seeks to set priorities for the U.S. nuclear program under sequestration. Today, the size of the U.S. stockpile and the scale of its reduction are less important than the operational posture of the nuclear forces and the cohesion of its system of command, control, communications and early warning. This has always been true. Cohesive and invulnerable nuclear command systems that increase warning and decision time for presidential deliberations in a crisis are critical to ensuring strategic stability and to preventing the accidental, mistaken, and unauthorized use of nuclear weapons. Therefore, a full-scale thorough review of the cybersecurity of all nuclear networks to identify and remove cyber warfare threats that could compromise the integrity of these networks is essential and must

not be sacrificed on the altar of sequestration. We cannot afford a lapse of vigilance in this arena that may result if the civilian workforce assigned to this mission at the National Security Agency, STRATCOM, U.S. Cyber Command, and elsewhere become casualties of a crude budgetary axe.

END



DR. BRUCE BLAIR

Bruce is the president of the World Security Institute, a nonprofit organization that he founded to promote independent research and journalism on global affairs. He is the Co-Founder of Global Zero, an international movement seeking the universal elimination of nuclear weapons, and is an executive producer of *Countdown to Zero*, a feature film about nuclear danger. Bruce is a member of the Secretary of State's International Security Advisory Board.

Bruce is an expert on nuclear weapons who has frequently testified before Congress. He has taught security studies as a visiting professor at Yale and Princeton universities. In 1999, he was awarded a MacArthur Fellowship Prize for his work and leadership on de-alerting nuclear forces. Blair was a senior fellow in the Foreign Policy Studies Program at the Brookings Institution from 1987 to 2000. In previous positions, he served as a project director at the Congressional Office of Technology Assessment, and as a Minuteman launch control officer. He holds a Ph.D. in Operations Research from Yale University.

**DISCLOSURE FORM FOR WITNESSES
CONCERNING FEDERAL CONTRACT AND GRANT INFORMATION**

INSTRUCTION TO WITNESSES: Rule 11, clause 2(g)(5), of the Rules of the U.S. House of Representatives for the 113th Congress requires nongovernmental witnesses appearing before House committees to include in their written statements a curriculum vitae and a disclosure of the amount and source of any federal contracts or grants (including subcontracts and subgrants) received during the current and two previous fiscal years either by the witness or by an entity represented by the witness. This form is intended to assist witnesses appearing before the House Committee on Armed Services in complying with the House rule. Please note that a copy of these statements, with appropriate redactions to protect the witness's personal privacy (including home address and phone number) will be made publicly available in electronic form not later than one day after the witness's appearance before the committee.

Witness name: Dr. Bruce G. Blair

Capacity in which appearing: (check one)

☒ Individual

☐ Representative

If appearing in a representative capacity, name of the company, association or other entity being represented:

FISCAL YEAR 2013

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
0			

FISCAL YEAR 2012

federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
0			

FISCAL YEAR 2011

Federal grant(s) / contracts	federal agency	dollar value	subject(s) of contract or grant
0			

Federal Contract Information: If you or the entity you represent before the Committee on Armed Services has contracts (including subcontracts) with the federal government, please provide the following information:

Number of contracts (including subcontracts) with the federal government:

Current fiscal year (2013): _____;
 Fiscal year 2012: _____;
 Fiscal year 2011: _____.

Federal agencies with which federal contracts are held:

Current fiscal year (2013): _____;
 Fiscal year 2012: _____;
 Fiscal year 2011: _____.

List of subjects of federal contract(s) (for example, ship construction, aircraft parts manufacturing, software design, force structure consultant, architecture & engineering services, etc.):

Current fiscal year (2013): _____;
 Fiscal year 2012: _____;
 Fiscal year 2011: _____.

Aggregate dollar value of federal contracts held:

Current fiscal year (2013): _____;
 Fiscal year 2012: _____;
 Fiscal year 2011: _____.

Federal Grant Information: If you or the entity you represent before the Committee on Armed Services has grants (including subgrants) with the federal government, please provide the following information:

Number of grants (including subgrants) with the federal government:

Current fiscal year (2013): _____;
Fiscal year 2012: _____;
Fiscal year 2011: _____.

Federal agencies with which federal grants are held:

Current fiscal year (2013): _____;
Fiscal year 2012: _____;
Fiscal year 2011: _____.

List of subjects of federal grants(s) (for example, materials research, sociological study, software design, etc.):

Current fiscal year (2013): _____;
Fiscal year 2012: _____;
Fiscal year 2011: _____.

Aggregate dollar value of federal grants held:

Current fiscal year (2013): _____;
Fiscal year 2012: _____;
Fiscal year 2011: _____.

DOCUMENTS SUBMITTED FOR THE RECORD

MARCH 19, 2013

**GLOBAL ZERO U.S. NUCLEAR
POLICY COMMISSION REPORT**

MAY 2012

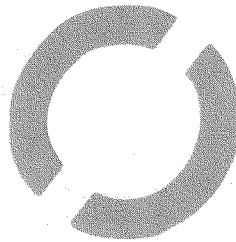
*Modernizing U.S. Nuclear Strategy,
Force Structure and Posture*



**GLOBAL
ZERO**

GLOBAL ZERO U.S. NUCLEAR POLICY COMMISSION REPORT

Modernizing U.S. Nuclear Strategy, Force Structure and Posture



**GLOBAL
ZERO**

A WORLD WITHOUT
NUCLEAR WEAPONS

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GLOBAL ZERO U.S. NUCLEAR POLICY COMMISSION

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AMB. THOMAS PICKERING

GEN. (RET.) JACK SHEEHAN

DR. BRUCE BLAIR, STUDY DIRECTOR

GLOBAL ZERO is the international movement for the elimination of all nuclear weapons. It has grown to 300 leaders and more than 450,000 citizens worldwide, developed a step-by-step plan to eliminate nuclear weapons, built an international student movement with 100 campus chapters in ten countries, and produced an acclaimed documentary film, *Countdown to Zero*. President Barack Obama, President Dmitry Medvedev, Prime Minister David Cameron, Prime Minister Manmohan Singh, Prime Minister Yoshihiko Noda and UN Secretary-General Ban Ki-moon have endorsed Global Zero, with Obama declaring, "Global Zero will always have a partner in me and my administration." Leading newspapers have backed Global Zero's plan, the *Financial Times* concluding that, "Global Zero's plan has shown the direction to be travelled; the world's leaders must now start moving."

CO-FOUNDERS: DR. BRUCE BLAIR AND MR. MATT BROWN

PRINCIPAL SPONSOR: DR. JENNIFER ALLEN SIMONS AND THE SIMONS FOUNDATION

GLOBAL ZERO U.S. NUCLEAR POLICY COMMISSION REPORT

Modernizing U.S. Nuclear Strategy, Force Structure and Posture

Introduction: An Illustrative Future U.S. Nuclear Policy and Architecture

This report defines an illustrative U.S. nuclear force structure, strategy and posture that reflect an alternative deterrence construct for the 21st century. The 20th century world of bipolar power and U.S.-Soviet confrontation has rather suddenly changed into a multipolar world with numerous emerging bases of geopolitical, economic and military power. For the United States, deterring and defeating aggression in today's world depends a great deal less on projecting nuclear offensive threat and a great deal more on the skilled exercise of all the instruments of power, both "soft" and "hard." Security, previously organized around bilateral confrontation, increasingly depends upon multilateral cooperation.

As a part of this profound shift, the United States will reduce its reliance on nuclear weapons and consequently will seek to negotiate further reductions in the U.S. and Russian nuclear arsenals following the ratification of the New START Treaty of 2011. In our illustrative plan, the United States over the next ten (10) years reduces its arsenal to

a maximum of 900 total nuclear weapons¹ and increases the warning and decision time over its smaller arsenal.² These steps could be taken with Russia in unison through reciprocal presidential directives, negotiated in another round of bilateral arms reduction talks, or implemented unilaterally. In parallel, these two powers possessing the lion's share of the world's nuclear weapons would also work together to bring all the nuclear weapons countries to the negotiating table for the first in history multilateral negotiations to limit nuclear arms.

These illustrative next steps are possible and desirable for five basic reasons. First, mutual nuclear deterrence based on the threat of nuclear retaliation to attack is no longer a cornerstone of the U.S.-Russian security relationship. Security is mainly a state of mind, not a physical condition, and mutual assured destruction (MAD) no longer occupies a central psychological or political space in the U.S.-Russian relationship. To be sure, there remains a physical-technical side of MAD in

¹ By "total" we mean all categories of weapons in the active inventory – strategic and non-strategic ("tactical"), and deployed and reserve.

² See also *Global Zero Action Plan*, Feb. 2010.

our relations, but it is increasingly peripheral. Nuclear planning for Cold War-style nuclear conflict between our countries, driven largely by inertia and vested interests left over from the Cold War, functions on the margins using outdated scenarios that are implausible today. There is no conceivable situation in the contemporary world in which it would be in either country's national security interest to initiate a nuclear attack against the other side. Their current stockpiles (roughly 5,000 nuclear weapons each in their active deployed and reserve arsenals) vastly exceed what is needed to satisfy reasonable requirements of deterrence between the two countries as well as vis-à-vis third countries whose nuclear arsenals pale in comparison quantitatively.

Second, the actual existing threats to our two countries (and the globe) cannot be resolved by using our nuclear arsenals. No sensible argument has been put forward for using nuclear weapons to solve any of the major 21st century problems we face – threats posed by rogue states, failed states, proliferation, regional conflicts, terrorism, cyber warfare, organized crime, drug trafficking, conflict-driven mass migration of refugees, epidemics or climate change. A large standing Cold War-like nuclear arsenal cannot productively address any of these dangers – for instance, it is unable to reliably deter or defeat terrorists with no return address, and its impact on proliferation may be largely counterproductive. In fact, nuclear weapons have on balance arguably become more a part of the problem than any solution. For instance, our large nuclear stockpiles and infrastructures run risks of theft by non-state

actors. Minimizing these risks costs billions of dollars each year and still they remain of deep concern; heads of state meet annually to muster stronger efforts to secure nuclear materials.

While our nuclear arsenals may be perceived by some as playing a role in deterring a nuclear-armed state like North Korea from attacking us or our allies, outsized arsenals are unnecessary for this purpose. We surely do not need thousands of modern nuclear weapons to play this role vis-à-vis a country with a handful of primitive nuclear devices. In fact, strong conventional forces and missile defenses may offer a far superior option for deterring and defeating a regional aggressor. Non-nuclear forces are also far more credible instruments for providing 21st century reassurance to allies whose comfort zone in the 20th century resided under the U.S. nuclear umbrella. Precision-guided conventional munitions hold at risk nearly the entire spectrum of potential targets, and they are useable.³

The dramatic shift in the threat environment from the 20th to the 21st century is underscored by last year's survey of several hundred experts by the Council on Foreign Relations.⁴ Russia is not even mentioned among the top twenty (20) contingencies that in their

³ For a rigorous analytical assessment of the capabilities of modern conventional weapons to perform missions once assigned to nuclear forces, see *Conventional Forces for Extended Deterrence*, Global Zero Technical Report, forthcoming.

⁴ *Preventative Priorities Survey: 2012*, Council on Foreign Relations, Dec. 8, 2011.

view directly threaten the U.S. homeland or countries of strategic importance to the United States. Far more worrisome to them are such specters as a massive cyber attack on U.S. electric power grids, severe internal instability in Pakistan shaking loose nuclear weapons that fall into terrorist hands, drug-trafficking violence in Mexico spilling over the border, political instability in Saudi Arabia threatening global oil supplies and a collapse of the euro that plunges the U.S. economy into deep recession.

Another compelling way to illustrate this tectonic shift is to describe the threat context of the last three times that the United States put its nuclear forces on high alert during a crisis that threatened U.S. national security. These alerts involved taking serious steps to increase U.S. readiness to undertake nuclear operations – steps like strategic missile crews retrieving launch keys and launch authentication codes from safes in their underground firing posts and strapping into their chairs to brace themselves against anticipated nuclear blasts from incoming warheads. The first time this happened was the Cuban Missile Crisis in 1962. The second time was the Yom Kippur War of 1973. Both cases featured 20th century nuclear brinksmanship between the United States and the Soviet Union – Cold War-style nuclear escalation, coercion and risk manipulation. But the third and last case was totally different. It happened on September 11, 2001. A powerful nuclear arsenal proved utterly powerless. It failed to deter the 9-11 terrorism and proved completely useless in responding to the multi-pronged attack.

In fact, the Minuteman missile launch crews feared they themselves might be terrorist targets. The eventual U.S. response of course took an entirely conventional course – routing the Taliban and occupying Afghanistan.

9-11 exposed the lack of efficacy – indeed, the irrelevance – of nuclear forces in dealing with 21st century threats. The last episode of nuclear brinksmanship between Americans and Russians took place nearly forty (40) years ago. Since then their nuclear weapons have increasingly become liabilities, not assets.

Third, the recommendation to make nuclear arms reductions a multilateral enterprise would remedy a basic deficiency in the framework of ongoing nuclear arms talks: the exclusion of everyone except for Americans and Russians. Many of the most serious nuclear risks in the world today thus lie outside the scope of redress through the extant forum for negotiated regulation. By limiting participation to the United States and Russia in a bilateral forum, a long and growing list of emerging nuclear dangers – such as Pakistan's unconstrained effort to produce fissile materials and expand its nuclear arsenal at a breakneck pace that may well propel it into third place in the pecking order of arsenal size – gets short shrift. A 21st century fraught with new nuclear threats like this one calls for comprehensive nuclear dialogue and negotiations involving all of the world's nuclear-armed states as well as key non-nuclear nations. The goal should be to cap, freeze, proportionately reduce or otherwise rein in nuclear weapons programs

across the board, not just the U.S. and Russian programs.

It will be challenging to get everyone to the table at the very beginning. The effort will probably only succeed by starting with a dialogue with China and others on matters of transparency and verification in particular. Sharing information on numbers, types and locations of nuclear stocks is a critical first step in laying the groundwork for formal arms control talks.⁵ A concerted effort by the United States and Russia could gradually transform such a dialogue into formal negotiations involving the non-NPT nuclear-armed countries (India, Pakistan, Israel) as well as China and the rest of the P-5 states (United States, United Kingdom, France, Russia). U.S. and Russian leadership in this arena would be bolstered by further deep cuts in their arsenals down to a maximum of 1,000 total weapons. Stockpiles of 500-1,000 total weapons on each side are roughly the level at which China could be drawn into the process. As more countries join, it will become harder for the rest to remain on the sidelines. It is essential to begin this effort right away in order to make nuclear arms control universal and relevant to 21st century nuclear dangers.

⁵ The monitoring and verification challenges of the proposals in this report include further strengthening of on-site inspections and developing new technical methods for monitoring individual warheads without revealing sensitive information about their design. We judge the current and expected increases in monitoring capabilities to be sufficient to ensure the parties' ability to verify compliance with the multilateral reductions and de-alerting proposals herein.

The fourth reason for undertaking these illustrative next steps of bilateral and multilateral arms control is that the world is spending vast sums on producing and maintaining nuclear arms and on mitigating their environmental and health consequences. In Global Zero's estimation, this sum will exceed \$1 trillion over the next decade.⁶ At a time of global economic stagnation and acute budgetary pressure on governments, the world can ill afford to lavish scarce resources on nuclear forces. The United States and Russia annually spend about \$60 billion and \$15 billion, respectively on them, inclusive of costs (actual or deferred) for health and environmental remediation of radioactive contaminated sites (or \$30 and \$10 billion, respectively, for their core operations). Furthermore, both are embarking on expensive modernization programs to replace their aging forces and infrastructure. Stimulated largely by each other's strategic programs, the cost to Russia is estimated to run upwards of \$70 billion over the next decade and to the United States upwards of \$200 billion over the next twenty years. These huge investments are being driven by outmoded logic – the Cold War logic of the 20th century. They are dubious investments in excessive numbers of unusable weapons at the expense of needed and useable conventional weapons. For example, the replacement of the

⁶ Bruce G. Blair and Matthew A. Brown, *Nuclear Weapons Cost Study*, Global Zero Technical Report, June 2011.

current U.S. Trident submarine fleet would consume three-fourths of the U.S. Navy's ship-building budget for many years. Similar extreme trade-offs confront many other countries, such as the U.K., which are facing replacement decisions for their geriatric nuclear forces.

The fifth and last reason for pursuing the illustrative steps is that the launch-ready nuclear postures of Russia and the United States present unnecessary risk. The technical situation today is a dangerous throwback to the Cold War, with warning and decision time in commanding and controlling hundreds of nuclear-armed missiles measured in minutes and seconds. The timelines and deadlines for existential decisions on both sides can be exceedingly short. U.S. teams in early warning centers responsible for assessing whether missile attack indications are real or false, a situation that happens daily, may be allowed only three (3) minutes to report their findings. In an emergency, senior U.S. nuclear commanders convened by phone to brief the President on his nuclear strike options and their consequences may be allowed as little as thirty (30) seconds to give the briefing. The President, if led to believe the attack indications are real, would have at most twelve (12) minutes to decide whether and how to respond with nuclear weapons or else risk nuclear command-control decapitation and the decimation of U.S. retaliatory forces. Upon receipt of a launch order sent without prior warning and preparation, U.S. missile launch crews in underground command posts and submarines would be allowed only

two (2) and twelve (12) minutes, respectively, to get their missiles out of their silos and tubes on their thirty (30) minute or shorter flights to targets on the other side of the planet. The missiles in peacetime are always ready to fly – silo-based missiles are armed, fueled, targeted and will launch instantly upon receipt of a short stream of computer signals from their launch crews. Submarine-based missiles are nearly as ready. Russia's alert posture is comparably poised for equally rapid operations.

The risks, while low, still exist for missiles to be fired by accident, miscalculation, mistake, false warning, bad judgment or unauthorized action.⁷ The results would be catastrophic. Given the end of the Cold War, it makes sense to end the Cold War practice of preparing to fight a large-scale nuclear war on a moment's notice. The launch-ready postures would be stood down and aligned with the current political realities of the U.S.-Russian relationship. Warning and decision time would be increased to days instead of minutes for strategic forces, and to days and weeks instead of hours for tactical forces.

⁷ We judge unauthorized launch to be the least likely of these risks. It is extremely improbable given existing safeguards on U.S. and Russian forces, although the risk would grow in the event of a crisis dispersion of nuclear weapons, particularly Russian tactical nuclear weapons. Unauthorized use is also a major concern for scenarios involving terrorist capture of nuclear weapons, and for scenarios involving third countries such as Pakistan whose organizational and technical safeguards may be inadequate.

A 21st Century Nuclear Strategy and Force Posture

U.S. security requires a strategy that deals with the changing nature of global threats and the new security priorities that are emerging as a consequence. The risk of nuclear confrontation between the United States and either Russia or China belongs to the past, not the future, while nuclear proliferation and nuclear terrorism present real and growing risks whose prevention or defeat demands global cooperation among the former adversaries.

Making the shift to a new strategy requires basic change along a multitude of vectors – shifting emphasis from nuclear deterrence to general deterrence of the array of tools at the disposal of hostile governments; from nuclear to conventional; from offense to defense (active and passive); from global to theater, regional and even local; from small to deep nuclear stockpile reductions; from high to low nuclear launch readiness; from an institutionalized threat-based relationship with Russia and China to a pattern of systematic cooperation and even operational coordination; from individual to collective approaches to dealing with emerging regional and local threats; from projecting a global threat of sudden nuclear strike that compresses decision-making, to removing this threat and increasing warning and decision time; from positive control enabling rapid nuclear release to negative control working to prevent the accidental or unauthorized release of nuclear weapons and prevent their seizure or capture by terrorists.

A U.S. nuclear force that satisfies the evolving requirements of this transition and that helps thwart nuclear proliferation and terrorism would have several characteristic features: (1) a substantially decreased stockpile of nuclear weapons and delivery vehicles on a path of reductions that lead in verifiable stages with an objective of their total elimination (“Global Zero”), (2) a de-alerted operational posture requiring 24-72 hours to generate the capacity for offensive nuclear strikes, thereby relieving the intense pressure on nuclear decision-making that currently exists, (3) a more secure, consolidated and “locked down” nuclear weapons stockpile that reduces the day-to-day risks of theft or unintended use, (4) a stood-up alert missile defense and conventional force capability that is prompt and global, and that can function sufficiently well for 24-72 hours that a regional adversary would be deterred or defeated during an initial period of conflict prior to the generation of nuclear offensive forces and (5) a command, control, communications and early warning system that could endure and maintain coherence for a protracted time period and manage an effective transition from negative to positive control over nuclear forces during the initial stage of conflict.

An Illustrative U.S. Nuclear Force Structure and Posture

An illustrative nuclear force that possesses these characteristics would consist of an arsenal of 900 total strategic nuclear weapons on modified alert that could be put in place within ten (10) years (2022). One-half of this

force would be deployed, with the remainder kept in reserve.⁸ The deployed forces of 450 warheads would be de-alerted and require a small number of days (24-72 hours) to become launch ready. Most of the 450 reserve warheads could be taken from storage and loaded on delivery vehicles within weeks to months.

Trident SSBNs and B-2 Bombers

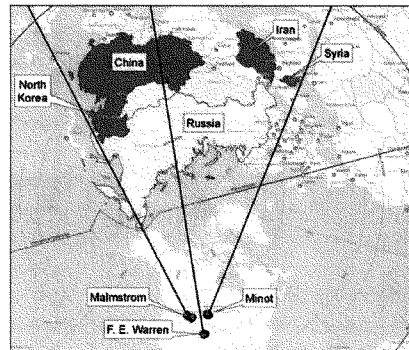
This notional force would consist of ten (10) Trident ballistic missile submarines armed with 720 strategic missile warheads (360 deployed; 360 reserve) and eighteen (18) B-2 bombers armed with 180 gravity bombs (90 deployed; 90 reserve). The submarine force would offer a high degree of survivability for many decades – no peer competitor currently has any effective anti-submarine warfare capability against U.S. SSBNs at sea and technological breakthroughs that could threaten this survivability are several decades away.⁹ Both submarines and bombers would offer a high degree of flexibility for reasons explained below.

⁸ The current ratio of deployed to reserve warheads is approximately 1 to 2.25. We estimate that by 2022 it will be possible to achieve a 1:1 ratio. Further progress in increasing warhead interoperability in the out-years would further reduce the need for reserve warheads to back up the deployed arsenal and hedge against a systemic defect in any warhead types.

⁹ There are potential threats on the distant horizon (30-50 years in future) that could dramatically alter this prognosis. Foremost among them is the prospect that sophisticated sensors coupled to supercomputing with advanced data filtering could strip away enough of the ocean's masking characteristics to expose the submerged boats.

Nuclear ICBMs and Tactical Weapons Eliminated

The Minuteman land-based ICBM force would be eliminated. ICBMs can only support nuclear wartime operations against Russia because current-generation ICBMs fired from the existing three (3) bases (shown on the map below) on their minimum energy trajectories have to overfly Russia and China to reach targets in potentially adversarial third countries (e.g., Iran, North Korea), and fly dangerously close to Russia to reach Syria. U.S. ICBMs would also have to overfly Russia to reach targets in China.



So the latitude for U.S. ICBM wartime operations is extremely circumscribed by orbital constraints. (Basic orbital mechanics are unclassified.) Since direct wartime nuclear operations against Russia alone, or Russia-China in combination, were Cold War scenarios that are no longer plausible, and since overflying Russia en route to more southerly targets (in China, North Korea, Iran)

risks confusing Russia with ambiguous attack indications and triggering nuclear retaliation, the U.S. ICBM force has lost its central utility. By contrast, U.S. Trident submarines and B-2 strategic bombers can deliver nuclear weapons to virtually any point on the earth on flight paths that avoid undesirable territorial incursions that violate national sovereignty and risk inducing nuclear responses.

Also, ICBMs in fixed silos are inherently targetable and depend heavily upon launch on warning for survival under some scenarios of enemy attack. Warning and decision time, as described earlier, is measured in minutes and seconds. While providing for “prompt” launch, they are too “prompt” and exacerbate risks of launch on false warning. Since only Russian nuclear missiles could physically decimate the U.S. ICBM force, and since the Cold War is over, this is largely a technical risk divorced from political realities. Nevertheless, the U.S. ICBM rapid reaction posture remains in operation and runs a real risk of accidental or mistaken launch.

By contrast, U.S. SSBNs at sea do not depend on rapid firing for their survival and thus work to increase decision time in a nuclear crisis. Although their communications links to higher authority are not as resilient and reliable as ICBM communications, the SSBNs on alert patrol normally maintain continuous VLF (very low frequency) communications and they may be promptly launched at the direction of the national command

authorities.¹⁰ SSBNs on launch patrol can be fired in twelve (12) minutes compared to two (2) minutes for the ICBMs. There are no effective defenses against submarine launched ballistic missile warheads.

Strategic bombers fall between these stools. Although they would need to be loaded with nuclear bombs and generated to strip alert status in a crisis (a 24-48 hour generation timeline) and then flushed quickly on warning of incoming strikes in order to survive, strategic bombers are highly flexible in their flight paths to targets anywhere around the globe. They are also recallable in many scenarios involving third countries and they may also carry lethal conventional weapons along with nuclear weapons to provide greater flexibility and usability. However, they have disadvantages. They are slow to reach their targets (many hours at minimum), require refueling for long-range missions and may have difficulty penetrating defenses compared to SLBM or ICBM warheads.

All U.S. tactical nuclear weapons would be eliminated over the next ten years. Their military utility is practically nil.¹¹ They do

¹⁰ Rapid advances in new higher-frequency communications modes involving special buoys dispersed on the surface of the oceans to link submerged SSBNs to higher authority are greatly increasing the reliability of launch order transmissions to SSBNs in all environments. The past clear-cut superiority of ICBM over SSBN communications for wartime dissemination of emergency action messages no longer exists.

¹¹ See *Global Zero NATO-Russia Commission Report*, Feb. 2012.

not have assigned missions as part of any war plan and remained deployed today only for political reasons within the NATO alliance. The obligation to assure U.S. allies in Europe and Asia of American commitment to their defense and to extend deterrence to them would fall to U.S. strategic nuclear and conventional forces, which are amply capable of fulfilling it.

Operational Posture and Nuclear Deterrence

A 10-boat fleet of Trident SSBNs would assign seven (7) to the Pacific and three (3) to the Atlantic basins. Assuming two (2) boats are normally in overhaul and the U.S. Navy maintains its historical at-sea rate of seventy (70) percent for the remainder, there would normally be four (4) and two (2) SSBNs at sea in the Pacific and Atlantic, respectively, carrying a total of 270 warheads. This day-to-day force would be survivable under worst-case conditions and versatile in providing prodigious target coverage of all prospective nuclear-armed aggressors. But a 270-warhead force would not pose a first-strike threat to Russia.¹² Also, this force would operate on modified alert outside the normal launch stations and require 24-72 hours to generate immediate offensive strike capability, in order to increase the amount of time available to leaders on all sides. This would prevent a

rushed launch decision by one's own leaders and remove the threat of sudden surprise attack that could otherwise trigger a rapid mistaken launch by an opposing force.

In an emergency, an additional two (2) Pacific boats in port armed with ninety (90) additional warheads could be flushed to sea within hours and the fleet of eighteen (18) B-2 bombers could be loaded with ninety (90) warheads and put on strip alert status within 24-48 hours. After 24-72 hours of force generation, the total number of survivable U.S. warheads would thus grow to 450.

A protracted nuclear crisis or severe deterioration of geostrategic relations between the United States and either Russia or China – both remote possibilities at this time – lasting for weeks or months would allow time for a large fraction of the U.S. arsenal of reserve warheads to be uploaded on SSBNs and B-2 bombers over the course of that period. By six (6) months into this period, the U.S. strategic arsenal could grow to upwards of 900 deliverable warheads.

The capacity to deliver 900 warheads would project a threat of draconian dimensions at any prospective aggressor country. A force of this size could support extensive counterforce against opposing nuclear forces, countervalue against war-supporting industries and operations against command centers of the opponent's top political and military leadership.

¹² According to Russian professional military sources in private communications with this Commission in Feb. 2011, their calculated threshold for the United States posing a decapitation first-strike threat against Russia is 300 U.S. warheads.

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Russia and China are not enemies of the United States. If they were, and nuclear planners allocated this 900-weapon arsenal according to Cold War targeting principles, the following (strictly) illustrative categories of targets and warhead assignments would be possible:

Russia: WMD (325 warheads including 2-on-1 strikes against every missile silo), leadership command posts (110 warheads), war-supporting industry (136 warheads). Moscow alone would be covered by eighty (80) warheads.

China: WMD (85 warheads including 2-on-1 strikes against every missile silo), leadership command posts (33 warheads), war-supporting industry (136 warheads).

North Korea, Iran, Syria: Each country would be covered by forty (40) warheads.

The capability in peacetime or crisis circumstances to deliver many hundreds of nuclear warheads to targets in any prospective aggressor country in retaliation to a nuclear attack satisfy reasonable requirements of nuclear deterrence even under worst-case Cold War-like conditions. These numbers substantially exceed the self-reported number of nuclear explosions on urban centers and high-level command posts that would effectively deter the only nations (Russia and China) possessing nuclear arsenals that

technically pose existential threats to the United States. According to a former senior general in the Russian strategic forces, U.S. nuclear retaliation against only a handful of Russian cities would cross the threshold of unacceptable damage in the view of Russia's top political and military leadership.¹³ U.S. retaliatory capability would be orders of magnitude greater than this. Also, an arsenal of 900 U.S. weapons would vastly exceed the size of the nuclear arsenals fielded by America's actual contemporary adversaries (namely, North Korea with less than 12 weapons; Iran with zero; Syria with zero). In short, although an arsenal of 900 total weapons would represent a whopping eighty (80) percent reduction from today's level, it would still possess enormous destructive power, far more than necessary to impress any potential rational foe. For the irrational foe, such as fanatical terrorists, the level of American nuclear armaments would make no difference at all.

Missile Defense and Conventional Force Augmentation

To mitigate the putative risk incurred by this sizable downsizing of the U.S. strategic arsenal, to partially offset the decrease in target coverage and to provide a cushion during an initial 24-72 hours of conflict when U.S. offensive nuclear forces are being generated to combat alert status, the United States and its allies would seek protection from vigilant

¹³ Col. Gen. (Ret.) Victor Esin (personal communication, Dec. 16, 2011).

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missile defenses and conventional forces kept on constant alert.

Missile defenses augmented by passive defenses (e.g., hardening, sheltering) could provide especially effective tools in deterring or defeating a regional adversary such as Iran or North Korea, and terrorists, for a 24-72 hour period. Such a time-limited requirement would ease the burden on missile defenses to intercepting the maximum number of offensive missiles that an adversary could launch during this period – defined as the total number of launchers times the number of reloads per launcher during a 24-72 hour period. Missile defenses would not have to handle every missile in the adversary's stockpile – only those that could be fired during this initial phase of conflict.

This reduced burden would allow a theater missile defense program such as the adaptive system for protecting Europe from Iran to be scaled down by ten (10) to fifty (50) percent. This downsizing, coupled with U.S.-Russian cooperation in this arena and confidence-building measures, such as establishing 100-mile exclusion zones for U.S. missile defense deployments adjacent to Russian territory, would reassure Russia that its strategic missile force would not be put in jeopardy. To provide further reassurance, the operational status of U.S. missile defenses would be tailored to the actual threat in the region. These defenses would only stand up on full alert if and when a commensurate Iranian or North Korean threat materialized. Russia and China would receive full notification if the alert status of

U.S. missile defenses were raised.

This theater strategy would be bolstered by advanced U.S. conventional arms whose accuracy of delivery allows them to reduce the role of nuclear weapons in covering the target base. The rapid increase in the lethality of conventional forces achieved in recent years allows conventional forces to threaten the destruction of very hard targets (including missile silos protected up to 1,000 pounds per square inch (p.s.i.). This technological progress translates into the capability of using conventional forces to cover practically one-hundred (100) percent of the North Korean, Iranian and Syrian target bases previously covered by nuclear forces.¹⁴ A prompt conventional pounding of an adversary's missile installations (e.g., in Iran or North Korea) could severely degrade its capacity and ease the work of U.S. missile defenses. For many such scenarios, U.S. conventional forces may well suffice to defeat a regional adversary without needing to generate any U.S. nuclear forces at all.

¹⁴ Regarding Russia and China, large-scale conflict with the United States is implausible. Theoretically, however, we estimate that U.S. conventional forces could cover between ten (10) and thirty (30) percent of an expansive Russian target base previously covered by U.S. nuclear forces. If Russia's planned \$150 billion investment in "air-space defense" over the next ten (10) years is productive then the target coverage figure would be lean toward the lower end of the range. Concerning China, we estimate that U.S. conventional forces could cover between thirty (30) and fifty (50) percent of the Chinese target base previously covered by U.S. nuclear forces. The Chinese target set is roughly one-half the size of the Russian target set.

Key Implications and 10-Year Implementing Strategy

This 10-year illustrative agenda aimed at reducing the number of U.S. nuclear weapons to 900 total warheads has basic implications for the nuclear complex, force structure and posture development and nuclear arms negotiations. If adopted, this agenda would reduce U.S. spending on nuclear weapons programs by as much as \$100 billion over the next decade.

Downsized Nuclear Complex

The illustrative nuclear force would deploy only four types of nuclear weapons – W-76 and W-88 on Trident SSBNs, and the B61 (mods 7 and 11) and B83 on B-2 bombers. The need for warhead refurbishment would be vastly decreased. The B61-11 recently completed a Life Extension Program (LEP); the W-76 LEP has already completed a sufficient number of these warheads to meet future requirements under this plan; and the W-88 and B83 are relatively new weapons whose LEP needs are far into the future. Only the B61-7 needs LEP work in the near future (to convert it to a B61-12), and the number of them needed for the bomber force is relatively small.

As a consequence, thousands of warheads in the LEP pipeline could be retired instead of refurbished. Also, the costly modernization of the nuclear complex currently underway – particularly the PF-4 and the CMRR-NF plutonium facilities at Los Alamos and the UPF uranium facility at Y-12 Oak Ridge – can

be restructured and downsized, depending on the balance of warhead refurbishment, reuse and/or replacement that emerges from a future review by the National Nuclear Security Agency (NNSA) and the U.S. Strategic Command.¹⁵ These agencies would need to consider eighty (80) percent cuts in the stockpile and determine an optimal strategy for improving surety, reliability, adaptability and maintenance at greatly reduced numbers of weapons.

Nuclear Force Structure and Posture

The follow-on nuclear ICBM program on the drawing boards would be cancelled, the plans for a fleet of next-generation bombers altered¹⁶ and the Trident follow-on program

¹⁵ In February 2012, President Obama deferred construction for five years on the \$6 billion CMRR facility. The need for such a facility would decrease substantially if the active U.S. stockpile shrinks to 500-900 total warheads as we recommend. Its primary purpose is to manufacture plutonium pits. Given the 50-year minimum normal lifespan of a plutonium pit, only two (2) percent of the stockpile would normally need new plutonium pits on an annual basis – 10-18 pits for 500-900 weapons. The current pit capacity of Los Alamos is roughly twenty (20) pits per year. In the event of a systemic defect in a warhead type that required a crash re-building of the warheads, the manufacturing rate might need to be several times greater than the current capacity if rapidly replenishing the stockpile was deemed critical to deterrence.

¹⁶ The U.S. Air Force currently plans to design and build 100-150 advanced bombers to replace the current fleet of B-52s and B-2s at a rough cost estimated to be \$550 million per plane. These current and future aircraft may perform long-range strategic missions and they are also interchangeable with tactical carriers on the battlefield and thus are replacing the older category of dual-purpose (nuclear-conventional) tactical platforms such as U.S. fighter-bombers stationed with B-61 nuclear arms in NATO Europe. Under our illustrative plan, the number of next-generation bombers configured to perform strategic or

delayed. All existing ICBM facilities and delivery vehicles, and all B-52 bombers, would be dismantled or converted to carry only conventional munitions over the course of the next decade.

Conventional ICBM. A conventional-armed extended-range ICBM – some variant of the Hypersonic Technology Vehicle-2 (HTV-2) – should be designed and developed to provide a 1-hour global strike capability by 2022.¹⁷ With a total of twelve (12) to twenty (20) such vehicles based in California, the Great Lakes region and/or Alaska (co-located with missile defense bases), this ICBM would have the down- and cross-range agility and reach to span continents flying within the stratosphere and promptly hit virtually any target around the world (such as North Korean or Iranian missile installations) without overflying Russia or China.¹⁸

This program would not be designed or deployed against Russia, and although it would possess an ability to destroy very hard

targets including missile silos, the small number of vehicles built and deployed would allay Russian concern about their impact on Russia's nuclear deterrent capability.¹⁹

A conventional and versatile long-range ICBM would overcome the drawbacks of other conventional delivery means – for instance, the range and speed constraints of Tomahawk IV missiles on ships and submarines, and the strategic conventional (dual nuclear and conventional capable) bomber's lack of timeliness and in some cases difficulty of penetrating air defenses. Combined with other conventional forces and alert missile defenses keyed to 24-72 hour effective operations, a versatile non-nuclear ICBM force would provide a timely strike option to buy time for nuclear force generation and leadership deliberation if the conventional phase of the conflict did not end decisively in favor of the United States. It would also provide a means of promptly hitting terrorist targets anywhere on the globe, greatly augmenting existing Predator drones and other tools.

tactical nuclear missions would be limited to 30-50 aircraft. The B-2 fleet would retire as the new bombers are fielded. 30-50 planes would allow for deployment and crew training to more than one physical location. (The current B-52 fleet is based at two locations, and the B-2s at a third base.)

A Phased, Consultative Approach to Increasing Warning and Decision Time. The strategy, force structure and posture outlined in this report work to create additional warning and decision time as they are implemented over

¹⁷ Russia started developing an HTV before the United States initiated its program, and President Putin attaches high priority to the program. Both programs are making progress, and both face major challenges – achieving aerodynamic stability in the Russian case, and overcoming heat shielding problems in the U.S. case. Russia recently experienced its second test failure of the developmental system.

¹⁸ Such a capability would require a downrange of 9,000 miles and a cross range of 3,000 miles.

¹⁹ It appears realistic to achieve an accuracy of 3 meters with a payload of 1,000 lbs. We calculate that this performance translates into roughly a fifty (50) percent chance of destroying a missile silo hardened to 1,000 lbs. per square inch (p.s.i.). Twenty (20) single-warhead HTVs would technically possess the capacity to destroy with high confidence only about six (6) missile silos.

the 10-year period. During the initial phase of a rebalancing of offense and defense, and of nuclear and conventional components, defensive systems would be put on higher alert as growing numbers of nuclear offensive forces were taken off of launch-ready alert ("de-alerted"). As the burden of deterrence shifted from MAD based on nuclear offensive operations to flexible response based on conventional forces (air, sea and land) with a prompt global strike component and on defensive operations (notably early warning, missile defense and cyber security), new opportunities will emerge for cooperation with allies and other countries with common security interests.

We envision cooperation progressing through stages beginning with heightened transparency and monitoring on a global basis. The United States and Russia would lead in providing to the rest of the world a comprehensive data stream on the status of maritime and airspace traffic and space objects. Augmenting this heightened global awareness of the earth and heavens, information would be provided on the status of U.S. and Russian (and eventually other nations') missile defenses as well as all offensive nuclear and conventional forces. Cyber security centers would provide near real-time information on the global cyber threat and cooperate in mitigating it.

In a second stage, early warning information would be shared in near real-time with all participating countries. This would

strengthen global cooperation in monitoring missile and other weapons tests, assessing proliferation threats and tracking military operations including hostile air-, sea- and space-actions during peacetime and conflict.

By the end of the 10-year period, international cooperation in the missile defense arena could be achieved. Active missile defense cooperation would complete the transition from MAD to mutual awareness, warning and defense. And the full transition would increase warning and decision time by hours, days, weeks and months.

De-Alerting to Increase Warning and Decision Time. De-alerting is a key element in achieving this goal. Any follow-on strategic nuclear forces including a Trident replacement submarine should be designed to enable the delivery systems and the warheads to be kept separated during normal peacetime operations and easily re-mated during an emergency. Existing forces were not designed for such a de-mated configuration. They were optimized for rapid reaction; de-mating warheads and missiles and re-mating them in an emergency are cumbersome, suboptimal operations. The goal of a new force posture is to keep all warheads and means of delivery separated in peacetime, in order to increase decision time, strengthen safety and security and prevent mistaken or unauthorized launches.

During the next ten (10) years, de-alerting can still be instituted with existing forces, however. We should close the books on the

Cold War and immediately put the nuclear arsenals into strategic reserve status on “modified alert.” This single stroke would greatly reduce nuclear risks while deepening U.S.-Russian cooperation and strengthening mutual stability. It would also have salutary effects on their relations with China and other countries currently threatened by the hyper-vigilant launch-ready postures of the nuclear superpowers.

Under this illustrative “modified alert” posture, SSBNs at sea would no longer patrol at their Cold War launch stations ready to fire within fifteen (15) minutes of receiving the order. The current strict requirements of speed, depth, navigation and communications would be relaxed. For example, the Cold War requirement for alert submarines to maintain continuous receive communications and readiness to fire almost instantly (within 12 minutes of receiving the order to fire) would be relaxed to 24-72 hours – providing greater freedom to train and exercise at sea as an additional benefit. Other measures, such as the removal of “inverters” on submarine missile tubes, would help ensure that 24-72 hours would be needed to fully re-alert the weapons onboard.

Similarly, land-based ICBMs would no longer be poised for full-scale launches on a moment’s notice. Instead, they would be “pinned and safed” in their silos, an existing safety measure (the reversal of which requires maintenance crews to re-enter the silos and remove the pins), thus precluding their launch during normal peacetime conditions

and requiring many hours to reverse. (The Chinese nuclear forces reportedly already meet this standard; indeed, they are in an even less threatening posture with warheads kept off their means of delivery.) As an interim measure during a transition to a wholesale strategic reserve status, a portion of the ICBM force – perhaps one of the nine current 50-missile squadrons – could be kept on launch-ready status on a monthly rotational basis. Eventually, however, all of the ICBMs would be dismantled according to the 10-year plan outlined here and their alert status would become moot.

Additional related measures should also be considered as part of this mutual, coordinated shift away from Cold War postures, to include removing all of the existing wartime targets from the ballistic missile submarine (SSBN) databases and the land-based missile (ICBM) computers. Fully restoring this data would take a number of days, thus building in a larger firebreak – 24-72 hours – between the onset of a crisis or conflict and the capacity to initiate nuclear strike operations.

Rigorous analyses have proven that de-alerting, if done properly and verifiably, would remove the threat of a sudden first-strike or decapitation strike and thus remove the incentive to maintain strategic forces poised to launch out from under a surprise enemy attack. Both sides could relax their postures while eliminating any incentives for re-alerting and launching a preemptive attack during a crisis. A well-designed posture can

eliminate any advantage to re-alerting, bolster the survivability of second-strike forces, substantially increase decision and warning time and stabilize mutual deterrence.²⁰

This new posture would represent a large improvement over the current one. The United States and Russia currently maintain about one-third of their forces on high alert; the other two-thirds require 24-72 hours to generate to launch-ready status. Their current postures are ill-designed for stability. They are actually quite unstable – prone to competitively rapid force generation and to launch on warning – and need to be re-designed to remove the re-alerting incentives behind this instability. Studies have shown that, if properly configured, all the strategic nuclear forces on both sides could be stood down from high alert and still achieve a much greater degree of stability than presently exists.²¹ Force survivability can be ensured even in the face of re-alerting by an adversary, and the key de-alerting measures such as separating warheads from delivery vehicles

can be adequately verified.²²

Regarding tactical nuclear weapons, the recommendations of the Global Zero NATO-Russia Commission Report put forward by American, European and Russian security leaders and experts make sense. They call for the United States and Russia to remove their tactical weapons from European combat bases and relocate them to national storage sites. We envision that this relocation would happen in the context of broader negotiations aimed at cutting their nuclear stockpiles down to 1,000 total weapons on each side.

This simple redeployment would increase warning and decision times for employing hundreds of these non-strategic weapons on each side from the current “hours” to a period of “days to weeks.” The absence of nuclear warheads at combat bases could be reliably confirmed by on-site inspections, and any large-scale covert effort to move warheads from national storage sites back to the combat bases would be readily detectable by space surveillance and other national technical means.

Bilateral Nuclear Arms Negotiations

The reductions and de-alerting proposed under this illustrative plan could be carried out in unison by the United States and Russia through reciprocal presidential directives, negotiated in another round of bilateral arms reduction talks, or implemented unilaterally.

²⁰ The leading studies that validate this assessment include Bruce Blair, Victor Esin, Matthew McKinzie, Valery Yarynich and Pavel Zolotarev, (1) “Smaller and Safer,” *Foreign Affairs*, Vol. 89, No. 5, September/October 2010; pp. 9-16 and (2) “One Hundred Nuclear Wars: Stable Deterrence between the United States and Russia at Reduced Nuclear Force Levels Off Alert in the Presence of Limited Missile Defenses,” *Science and Global Security*, Vol.19, 2011, pp. 167-194; Bruce G. Blair, “De-Alerting Strategic Forces,” in George P. Shultz et. al., *Reykjavik Revisited: Steps Toward a World Free of Nuclear Weapons*, Hoover Institution, 2008, pp. 47-105.

²¹ Ibid.

²² Blair, “De-alerting Strategic Forces,” op.cit.

In any case, these cuts would lead to yet another round of talks that would reduce the nuclear arsenals on each side to 500 total weapons.²³ These cuts to 500-900 total weapons apiece should be sufficient to bring China and other nuclear weapons countries to the table to begin multilateral negotiations for further cuts on the path to global zero.²⁴

²³ The consensus of former Russian senior military officers in Global Zero, led by Col. Gen. (Ret.) Victor Esin who once served as Chief of Staff of the Strategic Rocket Forces and now consults to the SRF Commander, is that a 900-warhead Russian arsenal should consist of: 450 deployed strategic warheads; 150 reserve strategic warheads, and 300 reserve tactical warheads. The strategic warheads would be deployed in either of these configurations: (a) 150 single-warhead ICBMs (50 silo-based and 100 mobile) and 8 "Borey" class SSBNs with 300 total warheads; OR (b) 300 single-warhead ICBMs (100 silo-based and 200 mobile) and 4 "Borey" class SSBNs with 150 total warheads. Dr. Bruce Blair and Col. Gen. Victor Esin (personal communications, February 2012).

²⁴ Some observers argue that deep cuts by the United States and Russia would tempt China to ramp up its nuclear weapons production to exploit the opportunity to achieve parity or even supremacy. This "race to parity or supremacy" argument is not based on any solid evidence. All the publicly available evidence supports the opposite view that deep cuts would draw the Chinese into a multilateral arms control regime that would lead to phased reductions. China has historically stayed out of the U.S.-Russian nuclear arms race, content to deploy a very small nuclear force in the service of "minimum deterrence." Its program is quite insensitive and detached from the U.S. and Russian programs, though its current modernization program seeks to ensure a minimum survivable deterrent in the face of external threats. China has historically advocated for nuclear disarmament on a universal basis, and in 1982 its Foreign Minister Huang Hua presented a blueprint for disarmament at the United Nations General Assembly meeting in which it committed to join multilateral negotiations if and when the nuclear superpowers cut their arsenals in half, stopped testing and building them, and otherwise exercised restraint. Global Zero discussions with high-level Chinese government officials, military officers and experts indicate strongly that China remains committed to this course. China would not "race to parity or supremacy" and in fact would take the op-

These strategic cuts and de-alerting, coupled with constrained U.S. missile defenses tailored to actual regional missile threats, should also go a long way toward breaking the current bilateral arms talks impasse with Russia, which is hung up on the potential technical capability of the United States to deliver a one-two punch of offensive and defensive operations against Russia's strategic nuclear missile forces once U.S. phase-four adaptive missile defenses (SM3-2B missile systems) become operational in ten (10) years (2022). Russia has sought a formal guarantee from the United States that its advanced missile defense system in phase four will not be aimed at Russia and will not undermine Russia's strategic deterrent forces. The United States has not met this demand nor provided other satisfactory assurances. As a result, Russia anticipates a continuing evolution of the U.S. program into increasingly threatening variants (including space-based strike systems in phases five and six) that become more difficult for Russia to offset with inexpensive countermeasures. The bilateral nuclear arms control process and even the broader U.S.-Russian relationship has stalled over this one technical complication.

posite position to join an arms reduction process if the United States and Russia reduce their arsenals to low numbers. See Maj.-Gen. Pan Zhenqiang, "China's Nuclear Strategy in a Changing World Strategic Situation," *Unlocking the Road to Zero: China and India*, Dr. Barry Blechman, ed., March 2009, pp. 29-54; 鲁斯·布莱尔博士: "全球零核倡议"运动回顾与展望", 载滕建群主编《全球核态势评估报告: 2010/2011》, 北京: 时事出版社, 2011年2月, 第161页。 (Dr. Bruce Blair, "The Global Zero Movement and China," *Global Nuclear Posture Review 2010/2011*, ed. Teng Jianqun (Beijing, 2011); and Bruce G. Blair, "Chinese Nuclear Preemption," *China Security*, Autumn 2005, No. 1, pp. 15-22.

The illustrative plan outlined above offers a solution. Under it, Russia (and China) would no longer be targeted in set piece war plans of the kind embodied in the longstanding plans that grew out of the Cold War face-off, and the de-alerting of U.S. strategic forces would preclude a sudden offensive strike. By removing the technical threat of a surprise U.S. nuclear first strike, the United States could no longer theoretically decimate the bulk of Russia's strategic forces, and the specter of U.S. missile defenses mopping up a small number of surviving Russian missiles after the strike would evaporate.

During the 24-72 hour time period needed for the United States technically to generate its offensive strike capability, Russian strategic forces could be flushed to secure locations. Mobile ICBMs and in-port SSBNs could be simultaneously dispersed to hidden locations to reduce their vulnerability and provide for an overwhelming Russian retaliatory capability. (The current Russian modernization program is concentrating on new mobile ICBM and SSBN production.) As a result, U.S. missile defense deployment would not pose nearly as great a technical threat to Russia, improving the prospects for a new round of fruitful U.S.-Russian nuclear arms negotiations.

The less good approach would be to adopt this agenda unilaterally. A strong case can nevertheless be made that unilateral U.S. deep cuts and de-alerting coupled with strengthened missile defenses and conventional capabilities would not weaken deterrence in practical terms vis-à-vis Russia,

China or any of the more plausible nation-state challengers that America may confront in the years ahead. While preserving effective deterrence against all but non-state actors, unilateral steps would lay the groundwork for increasing security cooperation among the former Cold War adversaries and encourage them to consider comparable unilateral actions. If unilateral U.S. de-alerting of its strategic offensive forces would cause Russia to follow suit, it would buy a large margin of safety against the accidental or mistaken launch of Russian missiles on hair-trigger alert aimed at the United States.

More broadly, this illustrative agenda with its deep cuts and de-alerting would strongly validate the Non-Proliferation Treaty and help preserve it in the face of challenges by North Korea, Iran and other prospective proliferators. In strengthening the NPT, inhibiting the spread of nuclear weapons and setting the stage for multilateral negotiations among the nuclear weapons countries to reduce and eventually eliminate their nuclear arsenals, this initiative would go far toward building a new security architecture embodying the vision of Global Zero – a world without nuclear weapons.

Multilateral Security Cooperation

A 21st century security plan meant to reduce reliance on offensive nuclear weapons and shift toward a more global, transparent and defense-oriented architecture designed to address the real threats facing the world today would be greatly strengthened through

broad cooperation along two dimensions. First, in replacing the blunt instrument of nuclear offensive threat with versatile, tunable and integrated power projection using modern high-tech components cutting across the spectrum of offense-defense and conventional-nuclear, there is a growing need for nations in the same security boat to share costs and operational responsibilities. No single nation can afford any longer to shoulder the full burden alone. Great mutual benefit accrues to nations with common interests who cooperate. The phased adaptive approach to missile defense in Europe is only possible through a division of labor and burden sharing within the NATO alliance. Japan is an essential partner of the United States in developing the guidance and warhead for SM3-2A/B missile defense interceptors that will become the backbone of phased missile defenses for America's Asian allies. Stretching this envelope of cooperation even further, it is a newly deployed radar in Israel supported by U.S. command-control-communications networks that enables Saudi Arabia's Patriot missile batteries to work effectively.

Second, as the last example suggests, the changing world is creating common interests among nations not previously aligned and often at loggerheads, and creating incentives for them to cooperate in the security arena. They often fail to exploit the opportunities – as evidenced by, for instance, the duplicative, inefficient deployment of three separate global space-based navigation systems. But economic forces and mutual security incentives are driving nations haltingly but

surely toward security globalization in the areas of monitoring, early warning and active defenses. Future cooperation will take the form of generating global output on maritime, aircraft and space activities that increase worldwide real-time monitoring of the seas, skies and heavens – an unprecedented level of situational awareness of the earth. It will take the form of shared early warning of missile launches and other potential threats through joint warning centers manned by Russians, Americans, Chinese and many other nationalities, and through joint technological ventures such as U.S.-Russian early warning satellite deployments with the output widely shared with other nations. Over time, this increasingly global cooperation will extend into the area of active missile defenses.

These trends appear to us to be deeply embedded in a globalizing world of growing economic and informational interaction and interdependence. They are not preordained, however, and we must therefore be prepared if our predictions for the next decade or so are wrong and the world becomes more confrontational in nuclear terms. It seems increasingly improbable that U.S. relations with Russia or China would deteriorate so severely during the time frame of this report's plan (2012-2022) that the nuclear balance among them would become a salient factor in their security relationships and cause them to suspend the nuclear arms reductions process and possibly even resume a nuclear arms race. However, this specter cannot be ruled out; if it happens, then the United States, despite possessing a stockpile of 500-900 nuclear

weapons, may feel more secure if it possesses the capacity to build up its nuclear forces in quantitative or qualitative respects.

We believe that the illustrative force structure and posture outlined in this report, augmented by contingency plans to regenerate the U.S. nuclear infrastructure, provide an ample margin of safety in the event of unanticipated developments that increase the nuclear threat to our nation over the next ten years or so. The trends described toward growing global transparency and security integration increase our ability to adapt if all these trends reverse course unexpectedly. But given the long lead times required to re-engineer our nuclear plans and programs in response to a marked increase in nuclear threat, our nuclear infrastructure must be resilient in the face of the unforeseen.

Conclusion

An urgent and transformational change in U.S. nuclear force structure, strategy and posture is needed to squarely address the security threats facing the nation in the 21st century. The strategy inherited from the Cold War which remains in place artificially sustains nuclear stockpiles that are much larger than required for deterrence today and that have scant efficacy in dealing with the main contemporary threats to U.S. and global security – nuclear proliferation, terrorism, cyber warfare and a multitude of other threats stemming from the diffusion of power in the world today. Current U.S. nuclear policy focuses too narrowly on threats rooted in

Cold War thinking, incurring excessive costs to prepare for an implausible contingency of nuclear war with Russia when there is no conceivable circumstance in which either country's interest would be served by deliberately initiating such a conflict. Current U.S. nuclear policy also unnecessarily incurs risks of unintentionally initiating a nuclear conflict. By maintaining launch-ready nuclear postures just as they did during the Cold War, the United States and Russia run risks of nuclear mistakes that could have catastrophic consequences.

The U.S. and Russian arsenals have been steadily shrinking since the end of the Cold War. These reductions should continue. Steep bilateral reductions in all categories of weapons in their stockpiles are warranted and should be pursued in the next round of U.S.-Russian negotiations. An arsenal of 500-900 total weapons on each side would easily meet reasonable requirements of deterrence and would set the stage to initiate multilateral nuclear arms reductions involving all countries with nuclear weapons. The United States should seek to achieve such reductions in ten (10) years and plan to base its arsenal on a dyad of nuclear delivery vehicles. The optimal mix of carriers would consist of ten (10) Trident ballistic missile submarines and eighteen (18) B-2 bombers. Under normal conditions, one-half of the warhead stockpile would be deployed on these carriers; the other half would be kept in reserve except during a national emergency. All land-based intercontinental missiles armed with nuclear payloads would be retired along with the

carriers of non-strategic nuclear warheads, all of which would be eliminated from the stockpile. B-52 heavy bombers would be completely dismantled or converted to carry only conventional weapons.

The United States and Russia should devise ways to increase warning and decision time in the command and control of their smaller arsenals. The current postures of launch-ready nuclear forces that provide minutes and seconds of warning and decision time should be replaced by postures that allow 24-72 hours on which to assess threats and exercise national direction over the employment of nuclear forces. This change would greatly reduce the risks of mistaken, ill-considered and accidental launch. It would also strengthen strategic stability by removing the threat of sudden, surprise first strikes. Any move by one side to massively generate nuclear forces to launch-ready status would provide ample warning for the other side to disperse its nuclear forces to invulnerable positions. By increasing warning time through de-alerting, the new postures would actually increase force survivability and diminish the adverse impact of missile defenses in the equation. Missile defenses would be less threatening to the other side's larger retaliatory force and less undermining of the other side's confidence in its ability to carry out effective retaliation.

In the context of such reduced reliance on offensive nuclear weapons on launch-ready alert, the United States would increase its reliance on missile defenses and advanced

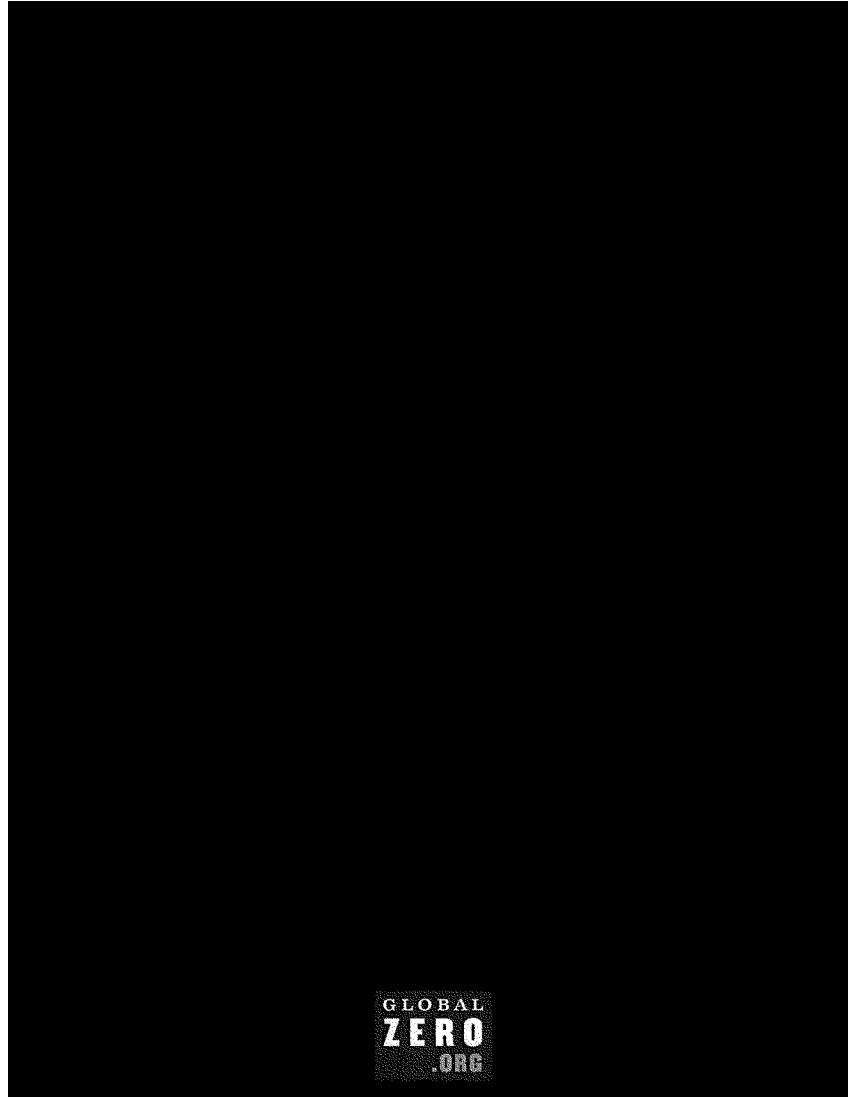
conventional forces in an integrated new strategy. These non-nuclear forces in a real sense would replace nuclear forces. Their role in deterring and defeating a 21st century adversary, and in reassuring U.S. allies of our commitment to their defense, would be especially important during the 24-72 hour period prior to the possible generation of offensive nuclear capability. This time-limited role, however, would reduce the requirements imposed on missile defenses and conventional forces. Missile defense architecture in particular could be scaled down.

It is critical to broaden the agenda of nuclear arms regulation to include all categories of weapons in all nuclear weapons countries. Only a broad multilateral approach can effectively address the multitude of serious nuclear dangers found in other parts of the world. While pursuing bilateral negotiations to reduce the U.S. and Russian stockpiles to much lower levels, the two sides should initiate a multilateral process that would seek to cap, freeze, reduce and otherwise constrain the arsenals of third countries. Nuclear arms regulation must become comprehensive and universal.

This multilateralism should be extended beyond nuclear arms reductions into the realm of multilateral security cooperation. 21st century threats demand heightened cooperation among longstanding friends and former foes alike. No single nation can any longer afford to go it alone in developing and deploying systems that strengthen its security.

Powerful economic forces and mutual security incentives are increasingly driving nations toward security globalization, particularly in the areas of monitoring, early warning and active defenses. Future cooperation will take the form of generating global real-time output that provides for an unprecedented level of situational awareness of the earth. It will take the form of shared early warning of missile launches and other potential threats through joint warning centers manned by Russians, Americans, Chinese and many other nationalities, and through joint technological ventures such as U.S.-Russian early warning satellite deployments with the output widely shared with other nations. Over time, this increasingly global cooperation will extend into the area of active missile defenses.

The illustrative strategy, force structure and posture outlined in this report, augmented by contingency plans to regenerate the U.S. nuclear infrastructure if the trends toward global security cooperation and multilateral arms regulation unexpectedly reverse course, provide a roadmap for strengthening U.S. security in the 21st century. It allows the United States to continue to reduce its reliance on nuclear weapons, to reduce nuclear dangers around the world and to move toward a world without nuclear weapons.



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MODERNIZING U.S. NUCLEAR STRATEGY, FORCES AND POSTURE
FOR THE 21ST CENTURY

General (ret.) James E. Cartwright

Testimony to the House Armed Service Committee

Subcommittee on Strategic Forces

March 6, 2013

Introduction

Congressman Rogers, Congressman Cooper and other distinguished members, it's an honor and a pleasure to present testimony before this committee. Thank you for inviting me. Much of my testimony and this statement are based on the my contributions to the commission report (*Modernizing U.S. Nuclear Strategy, Force Structure and Posture*, May 2012) and the soon to be released (Building Mutual Security in the Euro-Atlantic Region) report, chaired by Sam Nunn, Desmond Brown, Wolfgang Ischinger, and Igor Ivanov.

Aims and Purposes

The goal of these efforts was simple: conceive and articulate a nuclear strategy, force structure and posture that address the national security challenges our country faces in the 21st century. We first considered present and future threats, across the spectrum of

possibilities, ranging from deliberate or accidental nuclear attack by a nation state to terrorist nuclear attack, and everything in between. Then, we assessed the role of U.S. nuclear weapons in diminishing these dangers through deterrence or war-fighting, and weighed the potential for missile defenses, conventional forces, alliance cooperation, and diplomacy to offer non-nuclear tools to our kitbag for dealing with these threats. Next, we performed a net assessment of both the benefits and risks of further nuclear arms reductions and lowered launch readiness ('de-alerting'). Finally, we formulated a new construct for a 21st century nuclear strategy.

Of special interest was the paramount goal of broadening the scope of nuclear arms reductions to include all countries and all types of weapons in their possession. The nearly half-century of arms negotiations with the Russians has been an exclusively two-sided affair that has excluded some important players. These negotiations need to be extended to China and other nations whose nuclear arsenals pose serious dangers to international security. The major risks of nuclear weapons' use, proliferation and arms race instability in fact mostly lie outside the U.S.-Russian arena, particularly in Northeast Asia, South Asia and in the Middle East. It is essential to begin a multilateral process that brings the rest of the nuclear-armed world to the negotiating table to begin to cap, freeze, reduce and otherwise constrain these third-country nuclear arms programs. I believe that U.S. and Russian arsenals could be downsized substantially – 900 or fewer total weapons on each side – in order to draw these third-countries into the process.

A 2022 U.S. Nuclear Force

Our net assessment concluded that the current U.S. nuclear force remains sized and organized operationally for fighting the “last war” – the Cold War – even though threats from that era posed by the Soviet Union and China have greatly diminished and changed in character. Russia and China are not mortal enemies of the United States. Our geopolitical relations with our former Cold War adversaries have fundamentally changed for the better.

Ample latitude exists for further nuclear cuts. The extent of such cuts, the composition of the reduced arsenals, and the number of weapons held in reserve as a geopolitical hedge against a downturn in relations are matters worthy of public debate and of congressional hearings. There are a number of alternative force structures that would well serve to maintain a credible U.S. nuclear deterrent and advance other national security interests.

One such illustrative nuclear force would be composed of 900 total strategic weapons – total deployed and reserve -- on a dyad of ballistic missile submarines and strategic bombers. This would represent a reduction from the current U.S. nuclear arsenal. It would not be a small nor humble force designed for minimal deterrence, it would not entail a radical shift in targeting philosophy away from military targets to population centers, and it is not a city-busting strategy. On the contrary, it would hold at risk the major categories of facilities in all countries of interest to include the diverse sets of nuclear/WMD forces and facilities, top military and political leadership, and war-supporting industry. It would fulfill reasonable requirements of deterrence vis-à-vis every country considered to pose a potential WMD threat to the United States.

Strengthening Universal Nuclear Disarmament and Non-Proliferation

At the same time, an arsenal shrunk to 900 total U.S. weapons matched by comparable Russian reductions, would represent a dramatic cut that should work to draw the other nuclear countries into a multilateral process culminating in formal arms reduction negotiations among all nations with nuclear arms.

It should also demonstrate a serious U.S. and Russian commitment to fulfilling their disarmament obligations under Article 6 of the Non-Proliferation Treaty, and thereby help rally the anti-proliferation community to greater efforts to thwart would-be proliferators. The idea is not that virtuous U.S. and Russian behavior in the form of nuclear arms reductions could do much to inspire proliferators to abandon their quests for large arsenals. There are reasons to believe that such behavior could however inspire our anti-proliferation partners to get tougher with recalcitrant states seeking the bomb.

Reducing U.S.-Russia Nuclear Arms through Negotiations

Reductions to 900 total nuclear weapons in the U.S. and Russian arsenals should be the aim of the next round of bilateral New START follow-on negotiations. Unlike previous negotiations we should strive to reach a comprehensive, verifiable agreement that provides for equal reductions by both. This agreement should count all types of strategic and non-strategic weapons – with “freedom to mix” on both sides - and count every individual warhead or bomb whether deployed or held in reserve.

This is not a call for unilateral cuts by the United States. The only valid and useful approach should be to negotiate an agreement with the Russians. However, there may well be other ways to advance the goal of deep reductions. Some unilateral steps, or

parallel reciprocal steps along the lines of the 1991 Presidential Nuclear Initiatives, could facilitate the effort.

Russia has already dropped below its allowed ceiling of 1,550 deployed strategic forces stipulated by the New START agreement. It may behoove the United States to follow in Russia's footsteps and take advantage of Russia's unilateral reductions to reduce U.S. forces below the allowed level. This approach would be designed to remove the incentive for Russia to build its forces back up while allowing it to take advantage of the benefits, set out further in this presentation, of additional reductions. This would serve to lower the ceiling on deployments and maintain momentum for further reductions. It would match US and Russian forces, take advantage of Russian unilateral needs to restrict its force size, maintain stability, and serve as a further reinforcement of the process of mutual reductions. There is no reason why the present verification systems could not be used or adapted for use for these kinds of steps. In short, there is some scope for parallel, reciprocal steps to advance the cause of bilateral arms cuts. but we should pursue the cuts through direct negotiations with the Russians then, seek to add the other nuclear weapons countries to this formal process.

I also believe it is time to make a fundamental shift in negotiated warhead ceiling construct that would allow for the combination of both the tactical and strategic weapons to be considered together. This would allow each side to enjoy substantial latitude to choose the composition of their own forces, according to their perceived security needs, within the total negotiated warhead ceiling. This potential variation in the composition of forces is another reason to characterize the proposed U.S. force structure as "illustrative".

Experts differ on the relative merits of bombers, submarines, and land-based missiles, and also debate whether it is necessary to maintain three different types of nuclear delivery vehicles in the U.S. arsenal. I strongly support an open debate on the appropriate make-up of U.S. nuclear forces and acknowledge that honest differences of opinion exist.

From TRIAD to DYAD: Eliminating the Land-Based Missile Component

After evaluating the vulnerability, flexibility, and other key characteristics of the different delivery systems, a dyad of sea- and air-based strategic weapons, regional missile defense, global strike, Special Operations Forces, and General Purpose Forces would meet the post-Cold War requirements of deterring a WMD attack on the United States. The Minuteman land-based intercontinental ballistic missile (ICBM) would be eliminated in this scheme. The elimination of Minuteman stems from the fact that Minuteman is vulnerable and inflexible from a targeting standpoint.

Minuteman is vulnerable to sudden decimation unless it is launched promptly upon tactical warning of an incoming Russian missile strike. The ability to launch the Minuteman force promptly (within a few minutes) is often touted as a virtue, but in reality it is a liability. In the (admittedly extremely improbable) event of a large-scale Russian nuclear missile strike against the U.S. Minuteman fields, enormous pressure would rapidly be exerted upon the National Command Authority to authorize the immediate firing of the force en masse -- the deadline for a presidential (or successor) execution decision would be 12 minutes at most in this scenario. Moreover, the unleashing of Minuteman forces would necessitate unleashing other strategic missiles --

notably Trident submarine missiles, because of the integrated operational nature of major attack options to assure full coverage of all intended targets.

The second severe deficiency of Minuteman is its targeting inflexibility. It is suitable for the most unlikely scenario -- large-scale nuclear war with Russia -- but is unsuitable for nuclear conflict with North Korea or Iran because it would have to over fly both Russia and possibly China to reach either of them. This could create a situation that would add to the fog of conflict and the opportunity for unintended perceptions on the part of Russia or China. Put differently, the Minuteman force is suitable only for Russia contingencies.

Neither U.S. strategic submarine missiles nor strategic bombers are constrained by these rigid flight trajectories. They are more versatile platforms that offer highly flexible directions for attack against practically any target on the globe. Although a prompt global strike by Minuteman could be carried out with a single warhead, a Trident missile could perform the same mission (if a small number would be downloaded to carry a single warhead instead of the multiple warheads now carried) without risk of causing Russia to think it is under nuclear missile attack and ordering a nuclear 'counter-strike' in retaliation. Moreover, ballistic missile submarines, on alert patrol, can be fired almost as quickly as Minuteman missiles if necessary (15 minutes versus 2 minutes.).

Strategic Force Alert Posture

The day-to-day high alert posture of the United States today also represents a threat to Russia that has untoward, unanticipated consequences for the United States. By dint of possessing the ability to fire U.S. strategic missiles promptly on warning ("launch-

under-attack” in the operating vernacular), the United States concurrently possesses the ability to initiate a sudden massive strike against Russia (or any other country). This surprise attack option technically threatens the survival of almost all Russian nuclear forces in their day-to-day configuration unless, like the United States, Russia launches these forces out from under the attack, upon warning. When coupled with U.S. missile defenses designed against Russia’s strategic retaliatory forces – a current Russian fear despite American assurances that Russia is not a target of such defenses – this first-strike threat puts Russia on even greater vigilance and launch readiness.

The upshot is that both U.S. and Russian forces are kept on quick-launch alert because the other side does the same. This entwines the two countries in a proverbial “hair-trigger” dynamic that increases the risks of accidental, mistaken, inadvertent, misinformed, or unauthorized launch with devastating consequences. Launch on false warning is doubly worrisome in light of the chronic deficiencies in Russian early warning that are not going away anytime soon. This is a serious risk not to be undertaken without the greatest care to avoid it and I believe that can be done with these proposals while still protecting the essential security interests of the nation.

These postures also set a terrible example for the other nuclear armed nations, who for various reasons have not yet adopted launch-ready postures for their own forces. As a rule, their warheads and bombs are kept separate from their means of delivery, a safe practice that greatly reduces the danger of an unintended nuclear exchange. We can imagine a multitude of grave dangers that would emerge if this practice is abandoned in favor of increasing the launch readiness of nuclear forces. Acute instability would arise if Pakistan, India, China, and North Korea adopted a quick-launch posture requiring

execution decisions to be made within minutes and seconds on the basis of attack early warning indications from satellite infrared or ground radar sensors. The risks of unauthorized launch, or the terrorist capture of dispersed assembled weapons, would also grow significantly.

In short, the current launch-ready postures of the United States and Russia are major sources of instability. They not only generate pressure on leaders to make a premature decision on the use of nuclear weapons in a crisis, but they also run a risk of unintentional strikes. The postures pose an existential threat to the very survival of the United States, and Russia perceives no less cause for concern.

A negotiated agreement that cuts the Gordian knot and allows both sides to stand down their forces would well serve their vital security and safety interests. In a similar vein, I support a negotiation path that reduces both nations' day-to-day alert posture below a level that represents the ability to conduct a decapitating first strike option. In the illustrative 900 warhead option, the United States would deploy only 270 U.S. sea-based strategic warheads on day-to-day patrol, a number that is below the approximate threshold of 300 warheads that constitute a first-strike decapitation threat to Russia. This reduced deployment level would further allay Russian concern over its vulnerability and encourage it to pull back from its dangerous "hair-trigger" launch posture.

If the U.S. strategic arsenal required 24 to 72 hours to generate the ability to fire and the Russians followed suit, the world would be far safer and a norm would be forged to encourage other countries to maintain their current practice of keeping weapons separated from their bombers, submarines, and land-based rockets. This is not a unilateral step but a reciprocal one, beginning with Russia then followed by others. It would be

insured by the levels of reliability we have achieved thus far and can achieve through further work on the verification systems and procedures through which we have already engaged in our nuclear arrangements with Russia.

Prompt Launch Constrains Presidential Decision-making

While some observers may view this 24-72 hour generation requirement as a constraint that would hobble a U.S. president in a crisis, the commissions found that the current posture, which exerts pressure on the president to make a nuclear choice rapidly, is a far greater constraint. Launch-under-attack pressure severely hobbles presidential decision-making. It deprives our leaders of the time necessary for deliberation and of the tools needed to direct U.S. power to coherent national purpose.

New Strategy and Tools to Support Presidential Conflict Deliberation and Choice

Given the diversity and lethality of 21st Century threats, considering nuclear forces in isolation is no longer appropriate. We must use all tools available to both relieve the pressure on our leaders and reduce our reliance on nuclear only options as a primary or unique choice in the face of aggression.

The growing role for missile defenses and conventional forces include a new ICBM (HTV-2) with a conventional warhead and sufficient range to reach practically any target in the world from home bases on U.S. soil without traversing Russian territory during flight. Its range and accuracy would provide an unprecedented tool for destroying critical targets globally within one hour. At present, the only tool available to the president for such a global quick strike is a nuclear warhead atop a land- or sea-based

missile. Special Operations Forces also have a role in the ever increasing threat of terrorist acquisition and use of nuclear weapons. They must have the tools to detect, track and neutralize this emergent threat; a threat that is not reasonably addressed by strategic nuclear forces.

Missile defenses and conventional offensive forces as well as other kinetic and non-kinetic (cyber) tools of warfare, and various 'soft power' tools would be designed to buy time for a day or two and exert non-nuclear leverage to resolve a dispute before it could escalate to nuclear dimensions. This strategy would empower a president, not hobble him by extending the deadline for a nuclear decision thus providing some stability during a crisis. Again, it is the paucity of non-nuclear options and the time pressure to resort to nuclear options that represents the fundamental problem for presidential choice

Downsizing the Nuclear Complex; Risks and Cost Savings

The number of different types of nuclear weapons in the U.S. active inventory can be decreased from seven types today to four by 2022. The need to re-furbish weapons remaining in the stockpile would greatly diminish as almost all weapons previously requiring refurbishment could be eliminated from the active inventory. This curtailing of the life extension programs for thousands of weapons currently in the pipeline would save at least \$10 billion.

The existing plutonium pit facility at Los Alamos should be evaluated for its ability to service the regular pit manufacturing demands of a 900-warhead arsenal. Assuming a 50-year pit shelf life, only 2 percent of the active stockpile, or 18 warheads, would need to be re-manufactured each year. The facility has a normal throughput

capacity of about 20 per year with the possible option to add extra staff shifts in order to raise capacity to 40 pits per year. With the addition of extra equipment (5-6 years to install), the capacity could be increased to perhaps as high as 80 per year.

This number would grow higher still if old pits could be re-used and if pits with sensitive, conventional high explosives could be re-fitted with insensitive high explosives to improve safety. Current studies underway at the U.S. national laboratories, to be completed within the next couple of years, should determine the feasibility of these options. Preliminary analyses suggest that upwards of 50 percent of plutonium pits in the stockpile could be swapped out in these processes, allowing for a much faster rate of pit replacement.

In an emergency in which a systemic defect in one of the four warhead types warranted a crash effort to replace those warheads, it appears feasible that upwards of 120 defective weapons per year could be remedied through a combination of pit manufacturing and pit re-use. Such a systemic defect is a low-probability event, but assuming 225 defective warheads (notionally one-fourth of the 900-warhead total) needed to be repaired, it would take approximately two years of full-capacity work to finish the job.

In short, the current plutonium facility with some new equipment and working overtime with other partners such as the Pantex facility could probably handle an unusual emergency to replace a big chunk of the arsenal. The risk of reduced stockpile reliability must be acknowledged, if we shrink the variety of warhead types from seven to four, and the margin of comfort for replacing an entire category of weapons in the event of a systemic defect is not large. On balance, these risks seem to be manageable however, I

strongly recommend a full-scope survey by the pertinent agencies (National Nuclear Security Agency --NNSA, the national laboratories, and Strategic Command) to determine an optimal infrastructure in support of the 900-warhead arsenal outlined in the commission report.

Downsizing the Nuclear Force Structure; Risks and Cost Savings

Unforeseen Nuclear Challengers?

One concern is whether our illustrative force would be stretched thin and fall short if an unanticipated threat of major proportions emerged from an unexpected source – perhaps an unfriendly state that unexpectedly breaks out a substantial nuclear arsenal, or an existing state such as China that greatly expands its nuclear arsenal. (In China’s case, its recent nuclear modernization created an infrastructure capable of substantially increasing its existing small arsenal if it chose to do so.)

The answer to this has three parts. First, this is an intelligence challenge that warrants an intelligence estimate as to the likelihood of such break-out or rapid expansion scenarios over the next 10 years. A Chinese surge is unlikely to yield an arsenal much larger than 250-300 warheads. A Russian surge appears both financially and technically implausible. Although Russia has begun a strategic modernization program with upwards of \$70 billion earmarked for this purpose over the next ten years (an amount far less than the planned U.S. strategic modernization budget over the same period), the ability of its military-industrial infrastructure to deliver the goods has proven to be quite impaired. Pakistan, currently an unfriendly ally of the United States, is rapidly growing its arsenal but its focus is India. Other candidates for such a surge are unclear. In short,

while I do not claim clairvoyance, the prospect that any aspiring proliferator or existing nuclear-armed nation will undertake a crash build-up on a large scale is remote.

Second, it is highly doubtful that any of the hypothetical possibilities could unfold without being detected. Since the beginning of the nuclear age, no nation has ever produced enough nuclear weapons material to build a bomb without first being detected by foreign intelligence. (This applies even to the super-secret U.S. Manhattan project in the mid-1940s before the advent of satellite surveillance or on-site inspections.) It strains credulity to project a breakout of such a magnitude over the next ten years that the United States would wake up one morning and find itself “out-gunned”.

Third, in any case the proposed U.S. arsenal is sufficient to project a draconian threat of retaliation against any and all possible nuclear newcomers or late-bloomers over the next decade and beyond. It is sufficient to deter reliably any conceivable threat on the horizon.

Cost Savings

A significant cost savings would accrue if the illustrative force structure is implemented. A force reduction that includes the elimination of all Minuteman missiles (and cancellation of its replacement), removal of all B-52 nuclear bomber configurations and all tactical nuclear forces in the U.S. inventory, combined with a scaling back of future strategic submarine construction from 12 to 10 boats and of the strategic bomber replacement aircraft to a minimum number of nuclear-capable aircraft (e.g. 30), would save an estimated \$100 billion over the next 15 years. As noted earlier, the illustrative force would also impose lighter demands on the nuclear complex, saving an additional

(est.) \$20 billion during this period. The total savings for our proposed nuclear architecture is roughly estimated to be \$120 billion over the next 15 years.

Conclusion

The nuclear strategy, force structure and posture proposal is not necessarily the Holy Grail for the next phase of our nation's pursuit of security in the 21st century. The recommendations, however, are designed to more squarely and effectively address the real threats that our nation will be facing over the next decade than current U.S. nuclear policy promises. A fundamental transformation of our nuclear architecture and policy is needed to maintain a credible U.S. deterrent against classical risks of nuclear aggression by other nations while preserving strategic stability and protecting the nation against nuclear proliferation, terrorism, cyber warfare, failed states, organized crime, regional conflict and other threats the 21st century has wrought. I appreciate the opportunity to present these findings and join the debate.

Tim Morrison, 20130303

Senior Military and Defense Officials Who Disagree with Global Zero

Global Zero Position

(Pages 12 and 13) The follow-on nuclear ICBM program on the drawing boards would be cancelled, the plans for a fleet of next-generation bombers altered and the Trident follow-on program delayed. All existing ICBM facilities and delivery vehicles, and all B-52 bombers, would be dismantled or converted to carry only conventional munitions over the course of the next decade.

(page 16) The reductions and de-alerting proposed under this illustrative plan could be carried out in unison by the United States and Russia through reciprocal presidential directives, negotiated in another round of bilateral arms reduction talks, or implemented unilaterally.

Counterpoint: the U.S. Military's view

President Barack Obama: "I intend to (a) modernize or replace the triad of strategic nuclear delivery systems: a heavy bomber and air-launched cruise missile, an ICBM, and a nuclear-powered ballistic missile submarine (SSBN) and SLBM."¹

President Obama's 2010 Nuclear Posture Review: Retaining all three Triad legs will best maintain strategic stability at reasonable cost, while hedging against potential technical problems or vulnerabilities.

Senator Chuck Hagel, Nominee to be Secretary of Defense: "I don't -- I do not agree with any recommendation that would unilaterally take any action to further reduce our nuclear warheads and our capability... Every -- every option that we must look at, every action we must take to reduce warheads or anything should be bilateral. It should be verifiable. It should be negotiated."²

Secretary of the Air Force, Michael Donley: "I think, as, our nuclear force structure potentially gets smaller in the context of START, it's all the more important that we maintain a balanced triad going forward... In the context of rising nuclear capabilities elsewhere in the world, it's even more important that we have the flexibility across land and air-based and sea-based legs of the triad. We have flexibility of basing those, in targeting methods and other aspects of this mission that give us confidence that we can continue to deter potential nuclear ambitions of others and that we have the flexibility to respond if necessary through various means."³

Gen. C. Robert Kehler, USAF, Commander, U.S. Strategic Command: "The Triad of SSBNs, ICBMs and nuclear-capable heavy bombers, all with their associated support elements—offers a mutually reinforcing strategic package that provides a credible deterrent to our adversaries, assurance to our allies and partners, and flexibility for the President."⁴

¹ Message from the President on the New START Treaty to the Senate of the United States. February 02, 2011.

² Senate Armed Services Committee, Confirmation Hearing on the Nomination of Former Nebraska Republican Senator Chuck Hagel to be Secretary of Defense. Jan. 31, 2013.

³ John Reed, Foreign Policy.com. July 25, 2012.

⁴ Prepared Statement, General C. Robert Kehler, USAF, Commander, U.S. Strategic Command. Testimony before the House Armed Services Committee. March 5, 2013.

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Gen. C. Robert Kehler, USAF, Commander, U.S. Strategic Command: “I do not support what former vice chairman [Cartwright has said], although he and I are friends, and I certainly respect his opinion, I respect his intellectual horsepower on these kinds of issues...But I do not think that we are in the place that he suggests now, nor do I see that particular place any time soon,” he said, referring to a world where nuclear forces can be cut beyond current planned reductions. Regarding the Global Zero report, in my view we have the force size, force structure, and force posture today that we need for our national security needs.”⁵

General Kevin Chilton, USAF, then-Commander, U.S. STRATCOM: “The arsenal that we have is exactly what is needed today to provide the deterrent.”⁶

Lt. Gen. James Kowalski, USAF, Commander, Air Force Global Strike Command: “The world we live in today is not a world that is ready for zero nuclear weapons...So what do we need to think about? [there is a] temptation that lower numbers might be offering other nations to expand their arsenals and to join us at the high end of nuclear capability.”⁷

Major General William Chambers, USAF, Assistant Chief of Staff for Strategic Deterrence and Nuclear Integration –

Detailed analysis done for the Nuclear Posture Review explored a range of force structures and determined we should retain the three delivery systems. In our Post-Cold War era, the triad continues to provide the best blend of capabilities to guarantee a safe, secure and effective nuclear deterrent.

In times of tight budgets, some claim we can no longer afford the triad and should eliminate one leg. Such an argument contains two fallacies. The first is that budget pressure should drive us to eliminate the ICBM. On the contrary, an enduring ICBM is an existential security requirement, true in flush times and lean. The second is that no future enemy would consider nuclear use or coercion. The existence of our credible nuclear deterrent is the very thing that turns that hope into reality.⁸

⁵ Bill Gertz, “No to Nuke Zero.” *The Washington Free Beacon*. August 9, 2012.

⁶ General Kevin Chilton, USAF. Hearing of the Senate Foreign Relations Committee on the New START Treaty. 2010.

⁷ Elaine Grossman, “U.S. Nuclear Commander Warns Against Rushing Further Arms Cuts.” *Global Security Newswire*. September 14, 2012.

⁸ Major General William Chambers, USAF. “Keep Triad ‘Best Blend’ Of ICBMs, Boomers, Bombers; ‘We Can Afford Them’.” AOL Defense. November 1, 2012.

Tim Morrison, 20130303



Jim Kowalski (@AFGSC_CC)

11/2/12, 9:07 PM

Deter & Assure. Triad of subs, ICBMs, bombers affordable/effective guarantee of national sovereignty in uncertain world. aol.it/RwhqgS

Lt. Gen. Brent Scowcroft, USAF (ret.): “given the clear risks and the elusive benefits inherent in additional deep cuts, the burden of proof should be on those who advocate such reductions to demonstrate exactly how and why such cuts would serve to enhance U.S. security. Absent such a demonstration, we should not pursue additional cuts in the mistaken belief that fewer is ipso facto better.”⁹

General Larry Welch, USAF (ret.):

“The only basis for the idea that drastically reducing the number of nukes we have would magically make us safer and help eliminate other nuclear dangers is hope. But hope is not a plan, and hope is not a basis for security. Hope does not defend us. I would ask who would be willing to rely on hope for the safety and security of their family? No one would do that. The answer is nobody. Then why would anyone then rely on hope for the safety and security of this country and of more than 30 countries that depend on our extended deterrent? Leading the world to zero nuclear weapons is, at best, a fairy tale.”

“my belief that adequate strength in each leg of the triad is even more important today than it was at the height of the Cold War. Doing away with one of these legs does violence to one or more of essential four characteristics of an adequate deterrent force. To do so would increase risk.”¹⁰

⁹ Brent Scowcroft and Arnold Kanter, “Which nuke policy?” *Washington Times*. Washington, D.C.: Mar 24, 1997. pg. A.15.

¹⁰ Remarks by General Larry Welch, USAF (ret.). May 25, 2012.

QUESTIONS SUBMITTED BY MEMBERS POST HEARING

MARCH 19, 2013

QUESTIONS SUBMITTED BY MR. ROGERS

Mr. ROGERS. 1) Drs. Payne and Krepinevich: Do you wish to comment on the material in the questions submitted to Dr. Blair noted below?

Dr. Blair: the Global Zero report you led stated that:

“(page 16) The reductions and de-alerting proposed under this illustrative plan could be carried out in unison by the United States and Russia through reciprocal presidential directives, negotiated in another round of bilateral arms reduction talks, or implemented unilaterally.”

In his confirmation hearing to be Secretary of Defense, then-Senator Hagel stated: “I don’t—I do not agree with any recommendation that would unilaterally take any action to further reduce our nuclear warheads and our capability . . . Every—every option that we must look at, every action we must take to reduce warheads or anything should be bilateral. It should be verifiable. It should be negotiated.”

a. Dr. Blair, Do you agree with the Global Zero report or Secretary Hagel?

b. Why is verification important? Are you aware of any precedent for verification that isn’t treaty based?

c. Is verification important because we have to know if there’s cheating?

d. Dr. Blair, you cite the Presidential Nuclear Initiatives (PNIs) several times as an example of how further reductions, and actions like de-alerting, could be effectuated. Are you aware that Russia is not in compliance with those Initiatives, in other words, it is cheating? Does that change your endorsement of that approach?

Dr. PAYNE. The authors of the Global Zero report, including Dr. Blair, state specifically (on pages 1, 16 and 18) that unilateral U.S. reductions should be considered an acceptable course of action.

As noted in the question, the Presidential Nuclear Initiatives (PNIs) often are cited as examples of unilateral reductions. The PNIs were commitments by U.S. and Russian leaderships to extensive limits on their tactical nuclear weapons. According to considerable official Russian information, Russia is in violation of these commitments and has been so for years. A robust verification regime and vigorous U.S. response to Russian cheating that is discovered are essential to the integrity of any arms control process involving Russian strategic and tactical forces. In the absence of verification and compliance enforcement, Russia will violate such arms control agreements at its convenience. This has been the historical experience.

Mr. ROGERS. 2) Drs. Payne and Krepinevich: What comments would you have regarding the question to Dr. Blair noted below?

Dr. Blair, you assert in the Global Zero report that “mutual assured destruction (MAD) no longer occupies a central psychological or political space in the U.S.-Russian relationship.” On the other hand, Vladimir Putin tells his people that “[n]uclear weapons remain the main guarantee of Russia’s sovereignty and its territorial integrity, it plays a key role in maintaining global and regional stability and balance”. Sir, which of you is right?

Dr. PAYNE. Russia places more emphasis on nuclear deterrence now than it did during the Cold War. The Russian political and military leadership is absolutely clear in its public statements that nuclear deterrence remains its highest priority and that the United States and allies are Russia’s number one enemy. Russia’s vigorous nuclear modernization programs reflect these views.

Mr. ROGERS. 3) Drs. Payne and Krepinevich: What comments do you have regarding the question to Dr. Blair noted below?

Dr. Blair, you state in the Global Zero report that “the obligation to assure U.S. allies in Europe and Asia of American commitment to their defense and to extend deterrence to them would fall to U.S. strategic nuclear and conventional forces, which are amply capable of fulfilling it.” Sir, why, in your estimate has NATO asked, three times in 4 years, for the U.S. to keep forward deployed nuclear weapons—a.k.a. tactical nuclear weapons—in Europe?

Dr. PAYNE. NATO members have emphasized in the most recent open NATO consensus documents that nuclear deterrence is essential to NATO security and that the existing arrangement of U.S. nuclear weapons and Dual Capable Aircraft located in Europe are an essential element of NATO’s deterrence posture. Several key

NATO allies have openly expressed considerable concern over suggestions that the U.S. would withdraw nuclear weapons from Europe.

Mr. ROGERS. 4) Drs. Payne and Krepinevich: Do you wish to comment on the questions to Dr. Blair noted below?

Dr. Blair: the Global Zero report states that we could partly offset our nuclear force with “a stood-up alert missile defense and conventional force capability that is prompt and global, and that can function sufficiently well for 24–72 hours.”

Excepting for the fact that the Russians hate both of these capabilities, and the Senate has traditionally been hostile to conventional prompt global strike, can you state how much it would cost to deploy these capabilities? How many missile defense interceptors do we need, for example, to counter Iran’s thousands of short- and medium-range ballistic missiles?

a. How many would we need to defend Israel? How many would we need to defend Saudi Arabia? How many to defend the Emirate? How about all three combined?

b. How about the conventional prompt global strike capability you describe?

c. Is it possible that to develop and deploy these capabilities we wouldn’t in fact save any money over the relatively cheap nuclear capability?

Dr. PAYNE. Missile defense and conventional prompt global strike can add to U.S. deterrence capabilities. However, no one, including the authors of the Global Zero report, know if or to what degree nonnuclear forces can offset U.S. nuclear forces for deterrence. No one, including the authors of the Global Zero report, can predict the future functioning of deterrence in such detail. Available evidence suggests strongly that in some cases, U.S. nuclear weapons have been essential both for the deterrence of opponents and the assurance of allies. There is no evidence to suggest that the value of nuclear weapons for these purposes has declined. Indeed, contemporary statements of key allies demonstrate the continuing assurance requirement for U.S. nuclear forces. In addition, serious programs attempting to substitute conventional forces for nuclear deterrence purposes would likely entail greater costs than would be saved via the nuclear force reductions recommended in the Global Zero report.

Mr. ROGERS. 5) Drs. Payne and Krepinevich: Do you wish to comment on the questions to Dr. Blair noted below?

Dr. Blair, I note that this Global Zero report goes into a great deal of detail on U.S. and Russia nuclear force levels. Can you please describe how it helps to deal with the threat of instability in Pakistan’s nuclear program? Why have you invested so much time in dealing with relatively stable matters like U.S. and Russian nuclear forces, but, apparently none at all on matters like Pakistan’s nuclear program?

Dr. PAYNE. Placing strategic arms control negotiations with Russia as the central focus of U.S. nuclear policy and attention is an inheritance of the Cold War and an obsolete practice in the contemporary threat environment. More important are efforts to address Russian tactical nuclear weapons, Chinese and North Korean nuclear capabilities, and the Iranian nuclear program. To date, there is no apparent success in any of these, and the 2010 New START Treaty with Russia did not require any Russian deployed warhead or launcher reductions and has provided no apparent improvement in efforts to secure nonproliferation goals vis-à-vis North Korea, Iran or elsewhere.

Mr. ROGERS. 6) Drs. Payne and Krepinevich: do you wish to comment on the questions to Dr. Blair noted below?

Dr. Blair, your Global Zero report calls for increased reliance on missile defenses and “passive hardening” to deter or defeat a regional adversary for 24 to 72 hours. Yet, you try to have it both ways by capping missile defenses to not agitate Russia and China.

a. Please explain what you mean by “hardening” and “sheltering”? How expensive would bomb shelters to ride out North Korean or Iranian missile defenses be?

b. How many missile defense interceptors would we need to ride out 24 to 72 hours of attacks by Iran or North Korea?

c. How do we balance this with reducing the theater missile defense program by 10 to 50 percent?

d. How do we tell NATO that we are creating “100 exclusion zones,” as you propose, concerning the deployments of our missile defenses? How do you expect our Eastern European NATO allies would feel about that?

Dr. PAYNE. The programs identified in the Global Zero report, including hardening and sheltering, missile defense, and advanced conventional weapons, if undertaken to provide an alternative to nuclear forces for deterrence, would likely cost far more than the savings that could be realized by the deep reduction in U.S. nuclear forces. The Nuclear Zero report gives only one side of the cost implications of its proposal by identifying only the potential saving from nuclear reductions. It does not provide any net assessment that includes the additional unavoidable costs of its

missile defense and conventional force recommendations—thus it misleadingly points only to great cost savings. The notion of pushing “100 exclusion zones” within NATO is fanciful and would likely further degrade the U.S. ability to assure several key allies who already are wary of recent U.S. policy initiatives that appear to them to disadvantage their security.

Mr. ROGERS. 7) Drs. Payne and Krepinevich, why is a “no first use” policy a bad idea? Why have we never had one?

Dr. PAYNE. A “no first use” policy would tell opponents that they need not fear the U.S. nuclear deterrent if they use chemical or biological weapons of mass destruction against the United States or allies. It also would tell U.S. allies that the U.S. nuclear umbrella is not available to protect them from chemical or biological weapons, or from attacks by an opponent with overwhelming conventional capabilities. As such, a U.S. “no first use” policy should degrade the U.S. capability to deter chemical and biological weapons threats, and it would cause enormous concern among at least some key allies about the credibility of the U.S. nuclear umbrella. In addition, it is far from clear what practical benefit this declaratory policy would provide. There is, for example, no evidence to suggest that it would contribute to U.S. nonproliferation goals or inspire others to “follow the U.S. lead.”

Mr. ROGERS. 8) Would you please describe China’s so-called “no first use” policy? Is it as solid as some would have us believe? Why does that matter?

Dr. PAYNE. China’s “no first use” policy is highly ambiguous with regard to its actual meaning. This is not by accident. Chinese officials state that maintaining strategic ambiguity regarding China’s nuclear policies and forces is done intentionally. Even as stated openly by the Chinese, there are numerous conditions and caveats pertaining to the “no first use” policy. No one should expect this declaratory policy to affect China’s actual planning for the use of nuclear weapons. This is important because U.S. planning should take into account the potential for China’s first use of nuclear weapons in the event of a severe military crisis in Asia, particularly if the crisis involves Taiwan.

Mr. ROGERS. 9) Please describe China’s nuclear program, China’s aspirations as a nuclear power, and what that means for the Global Zero recommendations in terms of extended deterrence in that region?

Dr. PAYNE. According to open reports, China has vigorous nuclear force modernization programs. China’s aspiration is for a nuclear capability that is at least adequate to deter the United States from responding forcefully to Chinese political and military initiatives in Asia. For example, China has most recently disputed Japan’s sovereignty over Okinawa. These initiatives could easily lead to crisis confrontations with the United States and U.S. allies. The Global Zero report’s stated presumption that nuclear deterrence is not, and will not be pertinent to U.S. relations with China is a hope expressed as a truth. The report’s recommendations threaten to undermine the U.S. capability to deter China and the U.S. capability to assure allies who feel threatened by China. Against these potential risks, there are no plausible benefits for U.S. extended deterrence likely to be realized from its recommended policies.

Mr. ROGERS. 10) Drs. Payne and Krepinevich: Would you care to respond to any of the questions noted below?

Dr. Blair: Your report, *Modernizing U.S. Nuclear Strategy, Force Structure and Posture*, states that “Precision-guided conventional munitions hold at risk nearly the entire spectrum of potential targets, and they are useable.” (p.2)

Given your assertion that conventional weapons can address “nearly the entire spectrum of potential targets” addressed by nuclear weapons, it seems reasonable to assume that such weapons should become part of nuclear arms control negotiations.

a. Do you agree? If not, why not?

b. How many of these systems do we need to hold “nearly the entire spectrum of potential targets” at risk? How much would that cost and when could we deploy them?

c. As you know, Congress, the Senate in particular, has never been particularly willing to fund conventional prompt global strike capabilities. How does our inability to develop and deploy them affect your illustrated reduction scenario?

Dr. PAYNE. According to the Global Zero report, U.S. advanced conventional weapons can hold at risk only a fraction of the targets traditionally assigned to U.S. nuclear forces (page 11). And, given the prospective cost of these systems and the cost of the support infrastructure necessary for these systems, any plan to substitute them for nuclear deterrence forces is almost certain to cost more than the savings possible via their substitution.

Advanced conventional forces can, nevertheless, contribute to deterrence by expanding the threat options available to a president; they should not be captured by

arms control agreements. Unfortunately, the administration's New START Treaty already places limits on these systems. Moreover, Russia insists on further restrictions on advanced conventional strike capabilities as a condition for follow-on negotiations on reducing nuclear arms.

Mr. ROGERS. 11) Dr. Payne: Why do you say that the flexibility and resilience of the U.S. arsenal may be key for deterrence?

Dr. PAYNE. The flexibility and resilience of the U.S. nuclear arsenal may be key to U.S. deterrence effectiveness because the contemporary threat environment is diverse and shifting in terms of threats, opposing leaderships, contexts, and stakes. Requirements for deterrence effectiveness, correspondingly, are likely to vary greatly; one size and type of nuclear deterrent is unlikely to provide the type of credible deterrent effect needed to address a wide spectrum of plausible severe threats. Consequently, the U.S. arsenal must be sufficiently flexible and resilient to adopt U.S. deterrence capabilities to an extremely diverse threat environment. In short, the flexibility and resilience of the U.S. arsenal is likely to be a key to U.S. deterrence effectiveness. Those qualities of the U.S. nuclear arsenal are related directly to its size and diversity and would be threatened by the recommendations of the Global Zero report.

Mr. ROGERS. 12) Dr. Payne: How is it that these deterrence qualities (flexibility and resilience) are linked to the size and diversity of U.S. forces?

Dr. PAYNE. The flexibility and resilience of U.S. deterrence forces are linked directly to the size and diversity of the U.S. nuclear arsenal. The spectrum of possible U.S. nuclear threat options will depend on the variety of weapons and weapon platforms available. And, a large, diverse arsenal simply permits a wider array of deterrence threat options. Similarly, a large, diverse arsenal provides a greater variety of weapons and platforms with which to adopt to the shifting deterrence requirements of an ever-changing threat environment. If the future were fixed and benign, perhaps a small, fixed nuclear arsenal could be known to be adequate. But the future is not fixed and the emerging threat environment hardly appears to be benign. Consequently, flexibility and resilience are likely key ingredients to effective deterrence, and directly related to the size and diversity of the U.S. arsenal.

Mr. ROGERS. 13) Dr. Payne: Do you have any recommendations regarding the number of U.S. forces needed for the requisite level of force flexibility and resilience?

Dr. PAYNE. Yes. There are three benchmarks. First, the U.S. nuclear triad of launchers—bombers, ICBMs, and submarine-launched missiles—is a source of great flexibility and resilience for the U.S. nuclear arsenal. This is why the bipartisan Congressional Strategic Posture Commission emphasized the need to sustain the triad in its 2009 consensus report.

Second, following considerable analysis of the question, the 2001 NPR identified a range of 1700–2200 operationally deployed weapons and preservation of the triad as adequate for the needed flexibility and resilience.

Similarly, in 2010, Gen. Kevin Chilton said in open testimony that given this need for flexibility, he could accept no lower ceiling on U.S. deployed strategic nuclear forces than that of the 2010 New START Treaty, i.e., 1550. In doing so, he added elsewhere that the Treaty's bomber counting rules actually allowed a greater number of weapons than 1550, and that this factor was important in his acceptance of the ceiling.

The threat environment has only become more complex and dangerous since those numbers were identified. There has been no apparent basis for concluding that flexibility and resilience are now somehow less important or available with fewer weapons and launchers. In fact, the threat environment appears to be heading in darker directions.

Mr. ROGERS. 14) Dr. Payne: Why do you conclude that deep nuclear reductions could degrade the deterrence of opponents?

Dr. PAYNE. First, deep U.S. nuclear reductions will pressure the U.S. to move its deterrence threats to targets that are vulnerable and relatively few in number. Consequently, most proponents of deep nuclear reductions identify an opponent's soft civilian targets as the basis for the U.S. minimal deterrent threat. However, given the well-known U.S. desire to minimize civilian casualties, some opponents are likely to see such a U.S. deterrent threat as incredible for most all plausible contingencies. Some opponents have expressed this view openly. In addition, if the opponent is armed with a nuclear or biological arsenal, it may be particularly incredible for the U.S. to threaten to respond against that opponent's soft civilian targets given the opponent's likely capability to counter reply against U.S. vulnerable civilian targets. The deterrent threat that the U.S. would engage in a mutual process of destroying civilian targets may simply be an incredible U.S. deterrent as perceived by

at least some opponents, and thus an ineffective deterrent. It is not a prospect that should be encouraged by U.S. policy.

Second, deep nuclear reductions would likely reduce the flexibility and resilience of the U.S. arsenal, particularly if it led to elimination of the triad, as is likely. This would increase the prospects for deterrence failure because the U.S. might not have the number and/or diversity of nuclear forces necessary for deterrence purposes on those occasions when nuclear deterrence would be necessary to preserve peace or limit escalation.

Third, a very small U.S. nuclear arsenal almost certainly would be more vulnerable to attack by an opponent's covertly or overtly deployed forces. An effective U.S. deterrent force is one that does not invite attack upon itself by appearing vulnerable to enemy attack. Such a condition could encourage an opponent to strike first in a crisis when it otherwise would not consider such a strategy, and thereby degrade deterrence. Small U.S. numbers would, in this sense, be "destabilizing."

Fourth, a very small and thus more vulnerable U.S. nuclear arsenal could inspire nuclear arms competition by lowering the bar for opponents to acquire a capability to threaten the survivability of the U.S. deterrent. The U.S. forces recommended in the Global Zero report, for example, would leave the bulk of U.S. deployed strategic nuclear forces vulnerable to a very small number of enemy nuclear weapons. Such a U.S. arsenal could encourage opponents to move toward covert deployments and/or noncompliance with arms control measures for the same reason.

Mr. ROGERS. 15) Dr. Payne: Why do you conclude that deep nuclear reductions could degrade the assurance of allies?

Dr. PAYNE. Several U.S. allies, notably South Korea and Japan, already are deeply concerned that the U.S. drive to denuclearize is not reciprocated by the neighboring countries that pose nuclear-armed threats to them. They fear that further U.S. nuclear reductions simply will further degrade the credibility of the U.S. extended deterrent that is key to their security. As a consequence, some senior leaders in these allied countries now question the continued reliability of the U.S. "nuclear umbrella" as never before. They see the robustness of the U.S. nuclear arsenal and declared U.S. deterrence policy as critical to their own security, and thus are particularly disturbed by U.S. moves to denuclearize without corresponding movement that reduces the threats they face. The blatant fact that U.S. denuclearization appears to have no moderating effect on North Korean, Chinese, Iranian or Russian nuclear programs has led to the degradation of the important U.S. strategic goal of providing security assurance to some allies.

Mr. ROGERS. 16) Dr. Payne: Why do you conclude that deep reductions could actually promote nuclear proliferation?

Dr. PAYNE. Further deep U.S. nuclear reductions will deepen the concern already apparent among some key allies that the U.S. nuclear umbrella is losing credibility. Further U.S. deep nuclear reductions will compel some of these key allies to reconsider their commitment to their current nonnuclear status. This is not speculation; some allied political leaders already are expressing precisely these views. Consequently, further U.S. deep nuclear reductions could easily provoke, not prevent, further nuclear proliferation.

Mr. ROGERS. 17) Dr. Payne: Why do you conclude that deep nuclear reductions could actually lead to a need to increase U.S. defense spending?

Dr. PAYNE. The savings that would be available via even deep reductions in the number of U.S. nuclear weapons would not be substantial, as was most recently observed in open testimony by Dr. Don Cook, a senior official at NNSA. This is so because the costs of nuclear weapons generally are not driven directly by the number of nuclear weapons: a substantial reduction in warhead numbers would not yield similarly substantial savings. The potential for savings would come largely from abandonment of one or more legs of the triad. However, deep nuclear reductions in forces and launchers would necessitate a substantial expansion of U.S. advanced conventional weapons and improvement or replacement of some key enabling systems. The cost of doing so would almost certainly be more than the savings that could be realized by moving to a nuclear dyad, as recommended in the Global Zero report.

Mr. ROGERS. 18) Dr. Payne: Why do you conclude that nuclear deterrence could contribute to countering terrorism?

Dr. PAYNE. Historical evidence shows with no doubt that some terrorists organizations can be deterred indirectly on at least some occasions by deterring state sponsors of terror from providing support to their terrorist clients. There is no reason whatsoever to conclude that these state sponsors of terrorism, such as North Korea and Iran, are immune to U.S. nuclear deterrence threats. Consequently, the assertion that U.S. nuclear capabilities are irrelevant to terrorism is common but contrary to evidence and logic.

Mr. ROGERS. 19) Dr. Payne: Why do you doubt that U.S. advanced conventional forces can substitute for nuclear forces for deterrence and assurance purposes?

Dr. PAYNE. Advanced U.S. conventional forces and missile defense can contribute to deterrence. However, historical and anthropological studies indicate that nuclear weapons can provide unique deterrence effect because opponents perceive them as promising incalculable and unpredictable punishment for aggression against the U.S. and allies. Also, the percentage of casualties (of the global population) due to warfare calculated over centuries shows a dramatic and unprecedented drop following the introduction of nuclear weapons and nuclear deterrence. This reflects the historical fact that conventional deterrence fails catastrophically with some regularity. This has not been the case for nuclear deterrence, perhaps because nuclear weapons uniquely present would-be aggressors with incalculable, unpredictable punishment. The assertion that conventional weapons will substitute reliably for nuclear forces for deterrence purposes is a hope/wish that does not reflect available evidence.

Mr. ROGERS. 20) Drs. Payne and Krepinevich, would you care to comment on the questions to Dr. Blair noted below?

The President said at the State of the Union address last month that, “we will engage Russia to seek further reductions in our nuclear arsenals . . . because our ability to influence others depends on our willingness to lead.”

a. Dr. Blair, would you please explain just who has been following the President’s leadership? Put another way, with our unilateral reductions under the New START treaty, who has followed us in reducing? As you know, Russia was already below two of the three “central limits” of the New START treaty upon entry into force of the treaty.

Dr. PAYNE. There is little or no evidence that U.S. denuclearization has any positive impact on nuclear nonproliferation efforts or more formal arms control negotiations. No country appears to be following the U.S. lead in this regard—quite the contrary. In addition, there is available evidence that suggests that further deep U.S. nuclear reductions will motivate some allies and friends in the direction of nuclear proliferation. The linkage suggested by President Obama is common expression of hope unsupported by available evidence.

Mr. ROGERS. 21) Drs. Payne and Krepinevich, would you care to comment on the questions to Dr. Blair noted below?

Dr. Blair, in the recent Global Zero report, it was stated that “this illustrative agenda with its deep cuts and de-alerting would strongly validate the Non-Proliferation Treaty and help preserve it in the face of challenges by North Korea, Iran and other prospective proliferators.”

a. Can you describe in detail, and with specificity, how further nuclear reductions by the United States and Russia (if Russia is interested) will strengthen the Non-Proliferation Treaty and deal with the nuclear threats of Iran and North Korea? Specifically, what will other states (be specific as to which states) do to stop the spread of nuclear weapons if we only reduce our nuclear weapons further.

Dr. PAYNE. There is little or no evidence suggesting the validity of this linkage claimed in the Global Zero report. Instead, considerable evidence suggests that further deep U.S. nuclear reductions could hasten the collapse of the NPT by motivating U.S. friends and allies to move toward their own independent nuclear capabilities. In addition, the frequent assertion that the NPT mandates U.S. deep nuclear reductions independent of global movement toward general and complete disarmament is false.

Mr. ROGERS. 22) Drs. Payne and Krepinevich: would you care to comment on the questions to Dr. Blair noted below?

Dr. Blair: Do you agree with the finding of the 2010 Nuclear Posture Review that “fundamental changes in the international security environment in recent years—including the growth of unrivaled U.S. conventional military capabilities, major improvements in missile defenses, and the easing of Cold War rivalries—enable us to fulfill those objectives at significantly lower nuclear force levels and with reduced reliance on nuclear weapons?”

a. So how do the Budget Control Act and Sequestration change this calculus? Combined, we are spending \$1 trillion less over a decade on procurement, acquisition, operations and maintenance. For example, we can’t sortie or refuel aircraft carriers under the President’s sequester. Doesn’t this mean, if the logic of the NPR holds true, that, the assumption we can rely on our conventional capabilities and conventional deterrent, should be reconsidered?

Dr. PAYNE. First, available historical evidence suggests strongly that conventional weapons can contribute to deterrence, but not that they can replace nuclear weapons for the needed deterrent effect on at least some occasions. In some cases, it is

implausible to expect conventional forces to provide the necessary lethality or psychological effect needed for deterrence purposes.

Second, if U.S. policy, nevertheless, is to rely on conventional forces for deterrence, the number and types of conventional forces necessary, and the necessary supporting infrastructure, would likely be far more expensive than modernization of the triad and the nuclear weapons infrastructure. In any event, there is little evidence to suggest that the U.S. will invest in these conventional force programs.

Mr. ROGERS. 23) Drs. Payne and Krepinevich: Do you wish to comment on the material in the questions submitted to Dr. Blair noted below?

Dr. Blair: the Global Zero report you led stated that:

“(page 16) The reductions and de-alerting proposed under this illustrative plan could be carried out in unison by the United States and Russia through reciprocal presidential directives, negotiated in another round of bilateral arms reduction talks, or implemented unilaterally.”

In his confirmation hearing to be Secretary of Defense, then-Senator Hagel stated: “I don’t—I do not agree with any recommendation that would unilaterally take any action to further reduce our nuclear warheads and our capability . . . Every—every option that we must look at, every action we must take to reduce warheads or anything should be bilateral. It should be verifiable. It should be negotiated.”

a. Dr. Blair, Do you agree with the Global Zero report or Secretary Hagel?

b. Why is verification important? Are you aware of any precedent for verification that isn’t treaty based?

c. Is verification important because we have to know if there’s cheating?

d. Dr. Blair, you cite the Presidential Nuclear Initiatives (PNIs) several times as an example of how further reductions, and actions like de-alerting, could be effectuated. Are you aware that Russia is not in compliance with those Initiatives, in other words, it is cheating? Does that change your endorsement of that approach?

Dr. KREPINEVICH. I have no additional comments.

Mr. ROGERS. 24) Drs. Payne and Krepinevich: What comments would you have regarding the question to Dr. Blair noted below?

Dr. Blair, you assert in the Global Zero report that “mutual assured destruction (MAD) no longer occupies a central psychological or political space in the U.S.-Russian relationship.” On the other hand, Vladimir Putin tells his people that “[n]uclear weapons remain the main guarantee of Russia’s sovereignty and its territorial integrity, it plays a key role in maintaining global and regional stability and balance”. Sir, which of you is right?

Dr. KREPINEVICH. I have no additional comments.

Mr. ROGERS. 25) Drs. Payne and Krepinevich: What comments do you have regarding the question to Dr. Blair noted below?

Dr. Blair, you state in the Global Zero report that “the obligation to assure U.S. allies in Europe and Asia of American commitment to their defense and to extend deterrence to them would fall to U.S. strategic nuclear and conventional forces, which are amply capable of fulfilling it.” Sir, why, in your estimate has NATO asked, three times in 4 years, for the U.S. to keep forward deployed nuclear weapons—a.k.a. tactical nuclear weapons—in Europe?

Dr. KREPINEVICH. It is not possible to know for certain why European leaders have repeatedly requested that the United States maintain tactical nuclear weapons on their territory. Nevertheless, it is likely that three factors explain this point of view. First, forward-deployed tactical nuclear weapons have traditionally underpinned extended deterrence by providing limited nuclear options that could be exercised in response to conventional or nuclear aggression. During the Cold War, for example, Western conventional military forces were considered insufficient on their own to deter or counter an assault by the Warsaw Pact, because the Soviets and their satellites enjoyed a sizeable quantitative advantage. At the same time, U.S. strategic nuclear forces were not considered a credible deterrent to an invasion, because their use would trigger a reprisal against American targets by Soviet strategic forces. Second, although the Cold War is long-since over, these weapons continue to provide an important hedge against the prospect that relations between NATO and the Russian Federation could deteriorate in the future. Moreover, once withdrawn, it could be extremely difficult to redeploy tactical nuclear weapons in Europe given a confluence of fiscal, political, and operational-military considerations. Third, if the United States further reduces its conventional military presence in Europe, and if European nations fail to increase their own defense spending, then forward-deployed tactical nuclear weapons would arguably become the most important element of the alliance, and the key factor that ensures the security of America’s NATO partners—even in the absence of a near-term threat from Russia.

Mr. ROGERS. 26) Drs. Payne and Krepinevich: Do you wish to comment on the questions to Dr. Blair noted below?

Dr. Blair: the Global Zero report states that we could partly offset our nuclear force with “a stood-up alert missile defense and conventional force capability that is prompt and global, and that can function sufficiently well for 24–72 hours.”

Excepting for the fact that the Russians hate both of these capabilities, and the Senate has traditionally been hostile to conventional prompt global strike, can you state how much it would cost to deploy these capabilities? How many missile defense interceptors do we need, for example, to counter Iran’s thousands of short- and medium-range ballistic missiles?

a. How many would we need to defend Israel? How many would we need to defend Saudi Arabia? How many to defend the Emirate? How about all three combined?

b. How about the conventional prompt global strike capability you describe?

c. Is it possible that to develop and deploy these capabilities we wouldn’t in fact save any money over the relatively cheap nuclear capability?

Dr. KREPINEVICH. I have no additional comments.

Mr. ROGERS. 27) Drs. Payne and Krepinevich: Do you wish to comment on the questions to Dr. Blair noted below?

Dr. Blair, I note that this Global Zero report goes into a great deal of detail on U.S. and Russia nuclear force levels. Can you please describe how it helps to deal with the threat of instability in Pakistan’s nuclear program? Why have you invested so much time in dealing with relatively stable matters like U.S. and Russian nuclear forces, but, apparently none at all on matters like Pakistan’s nuclear program?

Dr. KREPINEVICH. I have no additional comments.

Mr. ROGERS. 28) Drs. Payne and Krepinevich: do you wish to comment on the questions to Dr. Blair noted below?

Dr. Blair, your Global Zero report calls for increased reliance on missile defenses and “passive hardening” to deter or defeat a regional adversary for 24 to 72 hours. Yet, you try to have it both ways by capping missile defenses to not agitate Russia and China.

a. Please explain what you mean by “hardening” and “sheltering”? How expensive would bomb shelters to ride out North Korean or Iranian missile defenses be?

b. How many missile defense interceptors would we need to ride out 24 to 72 hours of attacks by Iran or North Korea?

c. How do we balance this with reducing the theater missile defense program by 10 to 50 percent?

d. How do we tell NATO that we are creating “100 exclusion zones,” as you propose, concerning the deployments of our missile defenses? How do you expect our Eastern European NATO allies would feel about that?

Dr. KREPINEVICH. I have no additional comments.

Mr. ROGERS. 29) Drs. Payne and Krepinevich, why is a “no first use” policy a bad idea? Why have we never had one?

Dr. KREPINEVICH. The United States has traditionally preserved the option of being the first side to use nuclear weapons during a crisis or conflict for several reasons: to deter or defeat a conventional military attack that overwhelmed U.S. and allied forces, namely a Warsaw Pact invasion of Western Europe; to launch a damage-limiting first strike in response to unambiguous warning of an impending nuclear attack; and to deter or retaliate for an attack with chemical or biological weapons. Although Washington’s decision to forgo a “no first use” pledge was a product of the Cold War, and although the threat of a massive conventional assault that could only be stopped by using nuclear weapons has receded over the past two decades, there are still reasons to preserve existing policy. For example, the possibility of a biological or chemical attack, particularly by a rogue nation, still remains—and could increase in the years ahead. The United States also requires the ability to hold at risk hardened or deeply buried targets that cannot be reliably destroyed by conventional munitions. As a result, publicly adopting a no first use policy could weaken deterrence, undermine extended deterrence commitments to frontline U.S. allies, and remove options for countering hostile regional powers.

Mr. ROGERS. 30) Would you please describe China’s so-called “no first use” policy? Is it as solid as some would have us believe? Why does that matter?

Dr. KREPINEVICH. China has long pledged that it would not be the first nation to use nuclear weapons in a crisis or conflict. Nevertheless, there has been speculation that its definition of “no first use” might be different and considerably narrower than an American one. According to most recent report on China’s military power released by the Department of Defense, “there is some ambiguity over the conditions under which China’s NFU [No First Use] policy would apply, including whether strikes on what China considers its own territory, demonstration strikes, or high-altitude bursts would constitute first use.” Likewise, there has been recurring specu-

lation over the past several years that China might adapt or abandon this pledge in the future. More generally, there are reasons to doubt that commitments made during peacetime would be upheld in the event of war. Gaining greater insight into this issue is critical, therefore, because American actions in a future crisis with China would undoubtedly be shaped by Washington's assessment of the likelihood of escalation.

Mr. ROGERS. 31) Please describe China's nuclear program, China's aspirations as a nuclear power, and what that means for the Global Zero recommendations in terms of extended deterrence in that region?

Dr. KREPINEVICH. According to publicly available sources, China's nuclear arsenal consists of approximately 240 warheads and 140 silo-based and road-mobile ballistic missiles—including intercontinental and medium-range ballistic missiles. There has been speculation, however, that the size of its arsenal might be larger, perhaps over a thousand weapons. What is certain is that Beijing is modernizing its nuclear capabilities, to include fielding new road mobile ICBMs, several ballistic missile submarines, and a new submarine-launched ballistic missile. Collectively, these steps will enable Beijing to field a much more survivable nuclear arsenal. Because China appears more intent on making qualitative improvements to its arsenal than engaging in a major quantitative buildup, any effort to eliminate nuclear weapons would almost certainly require large unilateral or bilateral reductions by the United States and Russia before China would be willing to cap or reduce its own nuclear capabilities. In short, approximate parity between these three powers would be a prerequisite for any agreement among them—a position that the Global Zero organization explicitly acknowledges and accepts. An issue that merits further analysis, therefore, is whether and to what extent American extended deterrence commitments to its allies in East Asia will remain viable if the relative gap between U.S. and Chinese nuclear forces were to shrink considerably. Furthermore, in a world in which China, Russia and the United States each had the same number of nuclear weapons, it would not be possible for the United States to maintain parity against the other two powers. It would therefore be important to understand the dynamics of a nuclear competition in which the United States could find itself confronting an alliance of China and Russia.

Mr. ROGERS. 32) Drs. Payne and Krepinevich: Would you care to respond to any of the questions noted below?

Dr. Blair: Your report, *Modernizing U.S. Nuclear Strategy, Force Structure and Posture*, states that "Precision-guided conventional munitions hold at risk nearly the entire spectrum of potential targets, and they are useable." (p.2)

Given your assertion that conventional weapons can address "nearly the entire spectrum of potential targets" addressed by nuclear weapons, it seems reasonable to assume that such weapons should become part of nuclear arms control negotiations.

a. Do you agree? If not, why not?

b. How many of these systems do we need to hold "nearly the entire spectrum of potential targets" at risk? How much would that cost and when could we deploy them?

c. As you know, Congress, the Senate in particular, has never been particularly willing to fund conventional prompt global strike capabilities. How does our inability to develop and deploy them affect your illustrated reduction scenario?

Dr. KREPINEVICH. If conventional precision-strike weapons were indeed a functional substitute for nuclear weapons, then this would suggest that the former should be included in future arms control negotiations over the latter—an outcome that could disproportionately favor other nations given the United States' advantage in conventional precision-strike munitions. It is far from clear, however, that conventional weapons can actually perform the identical functions as nuclear weapons. Despite their virtues, conventional weapons do not possess the same ability to hold at risk wide area, hardened, or deeply buried targets. This suggests that the United States cannot rely upon conventional weapons alone for deterrence and extended deterrence, and should avoid efforts to conflate conventional and nuclear forces in any future arms control negotiations.

Mr. ROGERS. 33) Drs. Payne and Krepinevich, would you care to comment on the questions to Dr. Blair noted below?

The President said at the State of the Union address last month that, "we will engage Russia to seek further reductions in our nuclear arsenals . . . because our ability to influence others depends on our willingness to lead."

a. Dr. Blair, would you please explain just who has been following the President's leadership? Put another way, with our unilateral reductions under the New START treaty, who has followed us in reducing? As you know, Russia was already below

two of the three “central limits” of the New START treaty upon entry into force of the treaty.

Dr. KREPINEVICH. The evidence to date provides grounds for skepticism that other nations will follow the U.S. lead if Washington engages in further nuclear reductions. Both the United States and Russia have made deep cuts in the size of their nuclear arsenals over the past two decades. Nevertheless, nuclear proliferation has continued: India, Pakistan, and North Korea have joined the nuclear “club;” Syria and Iran have pursued the technical capabilities necessary to build nuclear weapons; all existing nuclear powers are modernizing their capabilities; and Pakistan and Russia appear to be lowering the barriers to nuclear use. In all likelihood, this can be explained by a simple observation: other nations’ nuclear programs are not primarily a response to the size and shape of the U.S. nuclear arsenal, but rather to local rivalries, domestic political considerations, and U.S. conventional military superiority.

Mr. ROGERS. 34) Drs. Payne and Krepinevich, would you care to comment on the questions to Dr. Blair noted below?

Dr. Blair, in the recent Global Zero report, it was stated that “this illustrative agenda with its deep cuts and de-alerting would strongly validate the Non-Proliferation Treaty and help preserve it in the face of challenges by North Korea, Iran and other prospective proliferators.”

a. Can you describe in detail, and with specificity, how further nuclear reductions by the United States and Russia (if Russia is interested) will strengthen the Non-Proliferation Treaty and deal with the nuclear threats of Iran and North Korea? Specifically, what will other states (be specific as to which states) do to stop the spread of nuclear weapons if we only reduce our nuclear weapons further.

Dr. KREPINEVICH. I respectfully refer back to my answer to question no. 33.

Mr. ROGERS. 35) Drs. Payne and Krepinevich: would you care to comment on the questions to Dr. Blair noted below?

Dr. Blair: Do you agree with the finding of the 2010 Nuclear Posture Review that “fundamental changes in the international security environment in recent years—including the growth of unrivaled U.S. conventional military capabilities, major improvements in missile defenses, and the easing of Cold War rivalries—enable us to fulfill those objectives at significantly lower nuclear force levels and with reduced reliance on nuclear weapons?”

a. So how do the Budget Control Act and Sequestration change this calculus? Combined, we are spending \$1 trillion less over a decade on procurement, acquisition, operations and maintenance. For example, we can’t sortie or refuel aircraft carriers under the President’s sequester. Doesn’t this mean, if the logic of the NPR holds true, that, the assumption we can rely on our conventional capabilities and conventional deterrent, should be reconsidered?

Dr. KREPINEVICH. The (questionable) assumption that conventional capabilities can substitute for nuclear weapons will be challenged by two trends that are already taking place. The first trend is the proliferation of conventional precision-strike systems, and in particular anti-access/area denial systems, which could make it increasingly difficult for the United States to project and sustain military power abroad. Put simply, arguments that the United States can decrease its reliance on nuclear weapons thanks to the growing sophistication of its conventional capabilities implicitly assume that the U.S. will maintain the near monopoly in conventional precision strike that it has enjoyed over the past two decades. But this advantage is waning, and conventional deterrence will likely erode as a result. The second trend now taking place is the changing fiscal environment, especially growing constraints on the U.S. defense budget highlighted by the Budget Control Act. Importantly, this development could limit Washington’s ability to develop and field the types of capabilities that might be necessary to maintain (or regain) its conventional military advantage, from new long-range strike platforms, to additional nuclear-powered submarines, to more advanced missile defenses. In sum, the view that the United States can continue to reduce its reliance on nuclear weapons thanks to its conventional military superiority appears likely to be seriously tested in the years ahead.

Mr. ROGERS. 36) Dr. Blair: the Global Zero report you led stated that:

“(page 16) The reductions and de-alerting proposed under this illustrative plan could be carried out in unison by the United States and Russia through reciprocal presidential directives, negotiated in another round of bilateral arms reduction talks, or implemented unilaterally.”

In his confirmation hearing to be Secretary of Defense, then-Senator Hagel stated: “I don’t—I do not agree with any recommendation that would unilaterally take any action to further reduce our nuclear warheads and our capability . . . Every—every

option that we must look at, every action we must take to reduce warheads or anything should be bilateral. It should be verifiable. It should be negotiated.”

a. Dr. Blair, Do you agree with the Global Zero report or Secretary Hagel?

b. Why is verification important? Are you aware of any precedent for verification that isn't treaty based?

c. Is verification important because we have to know if there's cheating?

d. Dr. Blair, you cite the Presidential Nuclear Initiatives (PNIs) several times as an example of how further reductions, and actions like de-alerting, could be effectuated. Are you aware that Russia is not in compliance with those Initiatives, in other words, it is cheating? Does that change your endorsement of that approach?

Dr. BLAIR. 36a) The Global Zero report (May 2012) chaired by Gen. (ret.) James Cartwright and co-authored by him, then-Sen. Chuck Hagel, Amb. Thomas Pickering, Amb. Richard Burt and Gen. (ret.) Jack Sheehan considered a wide range of approaches to implementing the report's recommendations. The unanimous consensus of these commissioners was that the reductions and de-alerting should be negotiated with the Russians and should be verifiable. I quote Gen. (ret.) Cartwright and Amb. Pickering's on-the-record words in clarifying this endorsement by the Global Zero commission:

“The commissioners agreed that cuts to 900 total nuclear weapons in the U.S. and Russian arsenals should be the aim of the next round of bilateral New START follow-on negotiations. We call upon them to reach a comprehensive, verifiable agreement that provides for equal reductions by both sides down to a total force of 900 weapons that counts all types of strategic and nonstrategic weapons—with “freedom to mix” on both sides—and that counts every individual warhead or bomb whether deployed or held in reserve. We wish to emphasize that the commission does not call for unilateral cuts by the United States. Our view is that the only valid and useful approach should be to negotiate an agreement with the Russians.”

Thus, the Global Zero report and the testimony of then-Sen. Hagel in his confirmation hearing to become Secretary of Defense are in complete agreement.

36b) Verification is important to ensure compliance with nuclear arms reductions agreements, and thereby to help preserve strategic stability and build confidence in the dependability of the parties in future arms agreements. As the U.S. and Russian nuclear weapons stockpiles decrease, the importance of verification grows. As the answer to 36a) question above indicates, the Global Zero report calls for counting and verifying every individual warhead and bomb of all types, whether deployed or held in reserve. This represents a higher standard of verification than has been adopted in the past. Previously, no agreement has regulated the total size of our stockpiles, and the deep reductions in nuclear stockpiles made during the past two decades have thus been essentially unilateral in nature.

Regarding the question whether there is any precedent for verification that is not treaty based, I would note two of them: First, no provisions for verification of the Moscow Treaty under President George W. Bush were explicitly provided for, though they were implicitly provided for by the previous START I Treaty that remained in force along with its extensive verification arrangements.

Second, verification of the Presidential Nuclear Initiatives (PNIs) of 1991 is not treaty based, but rather relies on U.S. ‘national technical means of verification.’ The 36d) question below asserts that Russia is not in compliance with these PNIs. Apparently, verification is possible in this case without treaty-based verification provisions in place.

36c) Verification is important to determine whether a party is cheating intentionally; clarify whether there are other explanations for noncompliance such as different interpretations of treaty obligations; and rectify the situation.

Also, verification is important to enable a party in full compliance with its treaty obligations to demonstrate its fidelity to the treaty and thereby boost the confidence of its treaty partners in its reliability. This confidence-building aspect, rather than the detection of cheating aspect, is the hallmark of the Nuclear Non-Proliferation Treaty. It is similarly an important aspect of all nuclear arms reduction agreements.

36d) While I believe that PNIs could offer an alternative approach to carrying out nuclear arms reductions or steps such as de-alerting, I generally do not endorse this approach over a treaty-based approach with adequate verification provided for by the treaty. However, in the specific case of the 1991 PNIs the purpose was not so much to facilitate an reduction in nuclear arms as it was to enable President Gorbachev to return to Russia and secure the thousands of Russian weapons dispersed in other countries that could have fallen into the hands of those countries or of unauthorized actors including terrorists or organized crime groups. Time was of the essence, and the PNIs were adopted and carried out in months instead of the many years that a formal arms negotiation would have taken to complete and implement.

As I recall, no American leader was worried about exact compliance with these voluntary actions, while many Americans were concerned with the security of the weapons.

As far as my awareness of Russian compliance with the PNIs of 1991, my own research based upon public sources suggests that Russia's pledges were largely kept but that the exceptions in which they were not kept are significant. I have not thoroughly assessed based on classified information the extent of compliance and non-compliance with these PNIs. I understand that the lack of verification provisions associated with the PNIs hampers our ability to determine exactly how compliant Russia is, but at the same time there is apparently sufficient independent verification on which to ground accusations of cheating.

Mr. ROGERS. 37) Dr. Blair, you assert in the Global Zero report that "mutual assured destruction (MAD) no longer occupies a central psychological or political space in the U.S.-Russian relationship." On the other hand, Vladimir Putin tells his people that "[n]uclear weapons remain the main guarantee of Russia's sovereignty and its territorial integrity, it plays a key role in maintaining global and regional stability and balance". Sir, which of you is right?

Dr. BLAIR. MAD remains a major technical factor in the security strategies of Russia as well as the United States, and nuclear deterrence is an especially important element in Russian security strategy vis-à-vis NATO, the United States, and China. However, the U.S., Russian, and Chinese nuclear arsenals have little or no utility in addressing the main threats facing these countries—nuclear terrorism, nuclear proliferation, and cyber warfare. The relevance of MAD after the end of the Cold War has declined precipitously as a technical matter, and moreover the perceived threat of nuclear aggression by any of these parties against any of the others is very much lower today compared to the Cold War period. Politically and psychologically, MAD no longer animates our relationships.

Mr. ROGERS. 38) Dr. Blair, you state in the Global Zero report that "the obligation to assure U.S. allies in Europe and Asia of American commitment to their defense and to extend deterrence to them would fall to U.S. strategic nuclear and conventional forces, which are amply capable of fulfilling it." Sir, why, in your estimate has NATO asked, three times in 4 years, for the U.S. to keep forward deployed nuclear weapons—a.k.a. tactical nuclear weapons—in Europe?

Dr. BLAIR. NATO countries' positions on whether to keep U.S. tactical nuclear bombs forward deployed in Europe vary widely. Most of the leading countries of the alliance, e.g., Germany, support withdrawing (unilaterally if necessary) these weapons back to U.S. territory. Others, particularly the Baltic members of NATO, favor keeping them or, alternatively, getting U.S. military troops to be stationed on their territories as a tripwire for U.S. engagement in their defense in the event of a Russian incursion. In short, NATO is divided on the issue, and since NATO operates by consensus requiring unanimous support for any major policy change, the default position of NATO is that the tactical weapons remain in Europe. Since the U.S. tactical nukes (B-61 air-dropped bombs) have scant military utility, their main purpose is 'alliance cohesion.' They primarily serve political purposes. Also, officially, NATO takes the position that as long as nuclear weapons remain in the world, NATO will remain a nuclear-armed alliance. (Of course the U.K. and France as well as the United States have strategic nuclear forces that ensure NATO will remain a nuclear alliance even if tactical weapons are removed from Europe.)

Mr. ROGERS. 39) Dr. Blair: the Global Zero report states that we could partly offset our nuclear force with "a stood-up alert missile defense and conventional force capability that is prompt and global, and that can function sufficiently well for 24–72 hours."

Excepting for the fact that the Russians hate both of these capabilities, and the Senate has traditionally been hostile to conventional prompt global strike, can you state how much it would cost to deploy these capabilities? How many missile defense interceptors do we need, for example, to counter Iran's thousands of short- and medium-range ballistic missiles?

a. How many would we need to defend Israel? How many would we need to defend Saudi Arabia? How many to defend the Emirate? How about all three combined?

b. How about the conventional prompt global strike capability you describe?

c. Is it possible that to develop and deploy these capabilities we wouldn't in fact save any money over the relatively cheap nuclear capability?

Dr. BLAIR. The report only goes so far as to say that these nonnuclear defenses and global strike systems could partly offset U.S. nuclear forces. Calculating the exact number and costs of these systems needed to perform various missions such as defending allies in the Middle East was beyond the scope of the Global Zero study.

It is certainly possible that the costs of developing and deploying these capabilities could exceed the costs of maintaining nuclear forces for these missions. However, the primary goal of this substitution is to extend the amount of time available to terminate a conflict before having to resort to nuclear weapons.

Mr. ROGERS. 40) Dr. Blair, I note that this Global Zero report goes into a great deal of detail on U.S. and Russia nuclear force levels. Can you please describe how it helps to deal with the threat of instability in Pakistan's nuclear program? Why have you invested so much time in dealing with relatively stable matters like U.S. and Russian nuclear forces, but, apparently none at all on matters like Pakistan's nuclear program?

Dr. BLAIR. The subject of the Global Zero report is U.S. nuclear force structure, posture and modernization. These matters are largely driven by Russia's forces, posture and modernization. Therefore the report focused on the U.S.-Russia nuclear policies and force levels. Also, the report's purpose was to illustrate an alternative U.S. force structure and posture on the assumption that further deep cuts in U.S. and Russian forces would be taken in the next round of nuclear arms reductions.

As for Pakistan and other countries, the report emphasizes their importance and the urgent need to broaden nuclear arms control beyond the U.S.-Russian bilateral process. The report underlines the fact that indeed the more serious risks of instability and nuclear weapons use, intentionally or accidentally, lie in South Asia and other regions. It is critical to bring these countries into a multilateral process to regulate their arsenals and prevent the outbreak of nuclear conflict and the acquisition of nuclear materials by terrorists. The deep bilateral cuts proposed by the report were designed to encourage China to join a multilateral process, which in turn would increase pressures and incentives for India and Pakistan to join. I certainly agree with the view expressed in this question to me that Pakistan poses unprecedented nuclear danger that demands our full attention.

Mr. ROGERS. 41) Dr. Blair, your Global Zero report calls for increased reliance on missile defenses and "passive hardening" to deter or defeat a regional adversary for 24 to 72 hours. Yet, you try to have it both ways by capping missile defenses to not agitate Russia and China.

a. Please explain what you mean by "hardening" and "sheltering"? How expensive would bomb shelters to ride out North Korean or Iranian missile defenses be?

b. How many missile defense interceptors would we need to ride out 24 to 72 hours of attacks by Iran or North Korea?

c. How do we balance this with reducing the theater missile defense program by 10 to 50 percent?

d. How do we tell NATO that we are creating "100 exclusion zones," as you propose, concerning the deployments of our missile defenses? How do you expect our Eastern European NATO allies would feel about that?

Dr. BLAIR. These important questions lie within the expertise of the Global Zero commission, particularly Gen. (ret.) Cartwright, but it is not an area that I can knowledgeably address without consulting with the commissioners and conducting further research.

Mr. ROGERS. 42) Dr. Blair, you state in the Global Zero report that we can "remove the technical threat of a surprise U.S. nuclear first strike," correct?

a. Is this another way of calling for a "no first use" policy?

Dr. BLAIR. The Global Zero report does not reject the first use of nuclear weapons. Rather, it calls for reducing the number of strategic weapons that could be fired in a sudden, surprise first strike. It merely thwarts the potential for a surprise first use of nuclear weapons.

Mr. ROGERS. 43) Would you please describe China's so-called "no first use" policy? Is it as solid as some would have us believe? Why does that matter?

Dr. BLAIR. China's long-standing policy is that its nuclear forces would only be employed in retaliation to a nuclear attack against China. It would not resort to their use in a conventional conflict as long as its adversary refrains from using nuclear weapons.

China's force levels and posture reflect a commitment to 'minimum deterrence' requiring a small number of nuclear forces capable of riding out a nuclear attack and striking back in retaliation against the aggressor. It's rejection of first use is evident in the historical record in which China does not marry up its nuclear weapons to its delivery vehicles during confrontations. It does not plan to prepare to employ nuclear forces in a conventional conflict even if it is losing on the battlefield.

The importance of this policy is that it bolsters nuclear stability during a crisis or conventional war. If China is observed keeping its nuclear weapons out of the fray, and not increasing launch readiness, any adversary will be less tempted to pre-emptively or preventively attack China's nuclear forces.

This policy historically has been very solid. The last time any senior official or general raised the possibility of Chinese nuclear first use was in 2005. This view was immediately quashed by the Chinese leadership and no-first-use was reiterated as China's firm position.

There is scant evident of any cracks developing in this position but as China's nuclear forces are modernized and as their capabilities to rapidly increase launch readiness of these forces improves, the Chinese may be tempted to expand their options beyond the current minimal deterrence policy. This is one of the reasons why the Global Zero report seeks the inclusion of China in a multilateral process of arms reduction negotiations.

Mr. ROGERS. 44) Please describe China's nuclear program, China's aspirations as a nuclear power, and what that means for the Global Zero recommendations in terms of extended deterrence in that region?

Dr. BLAIR. My answer above alludes to an across-the-board Chinese nuclear modernization program designed primarily to ensure a survivable deterrent force. China has a fleet of five new strategic submarines in various stages of construction and deployment, and a serious effort to deploy modern and capable mobile (truck-based) intercontinental rockets. Both programs serve to improve China's second-strike retaliatory capabilities.

China is also strengthening its safeguards against the unauthorized use of nuclear weapons, a newfound confidence that may lead to increasing launch readiness in peacetime.

On balance, however, China's military priorities lie in the conventional and space arenas with a view to 'area denial' of U.S. conventional forces, e.g. aircraft carriers, which play a critical role in the defense of Taiwan. Global Zero's focus is less on the question of countering China's nuclear programs with countervailing U.S. nuclear forces than on maintaining U.S. conventional superiority in region. The Global Zero report emphasizes the enormous capability of the United States to provide extended deterrence using conventional forces alone, but also notes the need to invest in new conventional capabilities such as a conventional ICBM in order to offset Chinese conventional and space modernization.

Mr. ROGERS. 45) Dr. Blair: Your report, *Modernizing U.S. Nuclear Strategy, Force Structure and Posture*, states that "Precision-guided conventional munitions hold at risk nearly the entire spectrum of potential targets, and they are useable." (p.2)

Given your assertion that conventional weapons can address "nearly the entire spectrum of potential targets" addressed by nuclear weapons, it seems reasonable to assume that such weapons should become part of nuclear arms control negotiations.

a. Do you agree? If not, why not?

b. How many of these systems do we need to hold "nearly the entire spectrum of potential targets" at risk? How much would that cost and when could we deploy them?

c. As you know, Congress, the Senate in particular, has never been particularly willing to fund conventional prompt global strike capabilities. How does our inability to develop and deploy them affect your illustrated reduction scenario?

Dr. BLAIR. 45a) In principle, if precision-guided munitions or other conventional forces (or missile defenses) impact the nuclear balance and strategic stability, then one could argue that they should be included in some form of arms negotiations, either separately from, parallel to, or integral to nuclear arms control negotiations. In practice, PGMs in particular do not lend themselves to such constraints inasmuch as their capabilities stem primarily from information and intelligence processing, which cannot be meaningfully limited. Quantitative limits on the number of specific weapons can be envisioned, as can geographic deployment constraints. The achievement of U.S. conventional superiority is not something to be bargained away, however, if it lowers the nuclear threshold at which the U.S. would resort to nuclear weapons to compensate for losing conventional options.

45b) The United States has already massively substituted conventional for nuclear weapons such that we can presently hold practically the entire spectrum of key military targets at risk in potentially hostile nations. Conventional forces now carry out missions that only nuclear forces previously could perform. For example, as my formal testimony asserted, U.S. tactical nuclear forces are no longer needed to suppress North Korea's artillery threat to Seoul. The cost of additional key capabilities such as conventional ICBMs requires further analysis.

45c) The inability to deploy a conventional ICBM for the purpose of prompt global strike would mean that certain targets, e.g. Chinese ASAT facilities, will grow increasingly invulnerable to available U.S. conventional-armed forces, e.g. B-2 bombers. This means that disabling such facilities will require increasing numbers of U.S. bomber sorties at growing risk to their crews. This would also mean that the

nuclear threshold would be lowered; in principle, the U.S. would need to resort to a strategic nuclear missile to disable critical targets if conventional forces cannot perform the mission.

Mr. ROGERS. 46) Dr. Blair: Your Global Zero report, *Modernizing U.S. Nuclear Strategy, Force Structure and Posture*, states that with respect to making nuclear arms reductions a “multilateral enterprise” involving states other than the United States and Russia, “the effort will probably only succeed by starting with a dialogue with China and others on matters of transparency and verification in particular. Sharing information on numbers, types and locations of nuclear stocks is a critical first step in laying the groundwork for formal arms control talks.” (pp. 3–4)

a. Since you assert that this is a “critical first step,” what assurances can you offer that: 1) China and Russia will provide accurate information? And, 2) that we have, in President Reagan’s famous phrase, the means not only to “trust, but verify” this information?

Dr. BLAIR. 46a1) I cannot personally guarantee that China and Russia would provide accurate information, but presumably they would opt to refuse to provide information in the first instance if the alternative is to provide false information and risk getting caught.

46a2) If the falsification of information is extensive, then U.S. national technical means of verification offer a reliable means of detecting that fact. Moreover, although our ability to detect a particular falsehood cannot be assured, a party contemplating submitting false declarations and disclosures could not be certain of its ability to elude detection by the other parties at the table. In general, the goal in the initial phase of discussions is to begin to define a baseline of nuclear stocks that can then be gradually investigated through intensified monitoring including onsite inspection with a view to shrinking the band of uncertainty surrounding the voluntarily submitted information.

Mr. ROGERS. 47) Dr. Blair: Your report, *Modernizing U.S. Nuclear Strategy, Force Structure and Posture*, states that “Stockpiles of 500–1,000 total weapons on each [U.S. and Russia] side are roughly the level at which China could be drawn into the process. As more countries join, it will become harder for the rest to remain on the sidelines.” (p. 4)

a. Has the Chinese Government committed to being “drawn into the process” if we reduce our nuclear forces to these levels? If they have not why should we assume that they will? Indeed, if this were the case it would seem their government would very much want to make such a statement as a way of incentivizing the Russians and ourselves to undertake further reductions—don’t you agree?

b. And, if what you assert regarding the ability of precision-guided weaponry to substitute for nuclear weapons, wouldn’t the United States also need to unilaterally drawn down its advantage in this area as well in order to have China join in the process?

Dr. BLAIR. 47a) The Chinese recognize that the Global Zero movement coupled to further sharp reductions in U.S. and Russian nuclear arsenals will increase pressure on China to join a multilateral arms reduction negotiation. Their historical position on participation in such a forum goes back to the early 1980s when the Chinese foreign minister addressed the United Nations General Assembly and laid out the conditions for joining such a negotiation—including preconditions such as 50 percent reductions by the United States and Russia. Those conditions have in fact already been essentially met. However, the Global Zero commissioners have proposed that the next round of deep bilateral reductions by the U.S. and Russia be linked to China’s acceptance of certain constraints on its nuclear arsenal—e.g. accepting a cap of 300 total weapons in 2022—which by the way is the maximum size of the Chinese arsenal projected out by a decade. (It currently stands at fewer than 200.)

47b) The conventional balance between China and the U.S. and U.S. allies in the region is relevant to the nuclear balance and to the prospects of bringing China into multilateral nuclear arms negotiations. Negotiations may well have to be extended into the nonnuclear arena. The exact forum and approach to this set of issues needs to be carefully considered. It’s uncharted territory that calls for creative thinking.

Mr. ROGERS. 48) Dr. Blair: Is there any evidence either now or in our historical experience to assume that when a country or group of countries engages in unilateral disarming that other countries find it “harder to remain on the sidelines?”

Dr. BLAIR. Global Zero commissioners are not so naïve as to believe that either unilateral or negotiated reductions will lead other countries to follow suit. Each nation’s assessment of its strategic interest in acquiring, or divesting, nuclear weapons is complex and unique. The example set by others may have little or no influence on a particular nation’s calculation of the purposes served by possessing nuclear weapons, or its determination of the desired size of its arsenal.

However, the massive unilateral stockpile reductions made by the United States and Russia over the past two decades and negotiated deep reductions proposed by Global Zero for the next decade strengthen their hands in trying to persuade China and others—including key nonnuclear states—to become stakeholders in nuclear arms control. It assists diplomats in making the case for, and exerting pressure on, the hold-outs to join the process. The historical disarmers—South Africa and the four former Soviet republics that surrendered them—along with major nations that abandoned their nuclear weapons programs such as Brazil and Argentina—reinforce this pressure.

Mr. ROGERS. 49) Dr. Blair, have you had any conversations with the White House about the so-called Nuclear Posture Review Implementation Study? a. When? b. What have you been told? c. Are you aware of what options they have been considering? Can you enlighten this subcommittee? We have been completely shut out of this process.

Dr. BLAIR. 49a,b,c) I have not had any direct conversations with the White House about any details of the NPR Implementation Study. My understanding is that several reduction options under consideration ranged from a high of 1,000–1,100 deployed strategic weapons to be implemented over a period of 5 years, to a mid-range of 700–800 such weapons over a 10-year drawdown, to a low of 300–400 such weapons within 15 years. These cuts and other reductions of nondeployed nuclear warheads would constitute an overall cut of 50 percent of the overall stockpile. The de-alerting options included one that would reduce the launch-readiness of U.S. strategic forces and require 48 hours to bring them to immediate launch-ready status.

One idea put forward in the internal process would have all of these options linked together in a time-phased reduction over a 15-year period, and to incorporate the phased reductions into the forthcoming Presidential Decision Directive (i.e., Presidential Nuclear Guidance) so that future cuts would be pursued by succeeding presidents unless a new Nuclear Posture Review were conducted and new presidential nuclear guidance issued to halt the drawdown. I expect that otherwise the forthcoming PDD on nuclear forces will not depart significantly from past guidance in terms of targeting and related force posture matters. I expect it to endorse the Triad, the launch on warning option, the first-use option, the requirement to be able to conduct full-scale nuclear operations against Russia and China simultaneously, and holding at risk WMD forces, leadership, and war-supporting industries in Russia, China, North Korea, Iran and Syria. I expect it will end the targeting of chemical facilities in Russia and China, though perhaps not such facilities in Syria. I also expect that it may assign missile defenses the task of defeating limited nuclear missile strikes by Russia or China.

Mr. ROGERS. 50) The President said at the State of the Union address last month that, “we will engage Russia to seek further reductions in our nuclear arsenals . . . because our ability to influence others depends on our willingness to lead.”

a. Dr. Blair, would you please explain just who has been following the President’s leadership? Put another way, with our unilateral reductions under the New START treaty, who has followed us in reducing? As you know, Russia was already below two of the three “central limits” of the New START treaty upon entry into force of the treaty.

Dr. BLAIR. This statement from the State of the Union address reflects the historical reality that the United States has been the strong leader in the instigating nuclear arms reduction negotiations and other nuclear security efforts such as the Nunn-Lugar program. Regarding the New START Treaty, President Obama took the lead in starting those negotiations with former President Medvedev and he now is enlisting President Putin’s support for starting the next round. Within the context of the New START reductions schedule, Russia has taken the lead in the sense that it is ahead of the required drawdown schedule, and the United States is following this lead.

Mr. ROGERS. 51) Dr. Blair, in the recent Global Zero report, it was stated that “this illustrative agenda with its deep cuts and de-alerting would strongly validate the Non-Proliferation Treaty and help preserve it in the face of challenges by North Korea, Iran and other prospective proliferators.”

a. Can you describe in detail, and with specificity, how further nuclear reductions by the United States and Russia (if Russia is interested) will strengthen the Non-Proliferation Treaty and deal with the nuclear threats of Iran and North Korea? Specifically, what will other states (be specific as to which states) do to stop the spread of nuclear weapons if we only reduce our nuclear weapons further.

Dr. BLAIR. By ratifying the NPT, the United States and Russia assumed a legal obligation to reduce and eventually eliminate their nuclear arms—the disarmament pillar of the Treaty. It is an obligation under international law that cannot be ignored. The nonnuclear weapons signatories of the NPT also expect the nuclear

weapons states to undertake other steps related to nuclear disarmament such as ratifying the CTBT and lowering the launch readiness of nuclear forces.

To the extent that the United States, Russia and other nuclear weapons states demonstrate their commitment to the NPT disarmament agenda through deep cuts and de-alerting and other steps, the greater the onus on the nonnuclear weapons states to remain nonnuclear and the greater their commitment to the enforcement of the NPT—e.g., preventing Iran from acquiring nuclear weapons and rolling back North Korea's weapons capabilities. Without this backing from the nonnuclear weapons countries, the risks of proliferation will grow.

Mr. ROGERS. 52) Dr. Blair: Do you agree with the finding of the 2010 Nuclear Posture Review that “fundamental changes in the international security environment in recent years—including the growth of unrivaled U.S. conventional military capabilities, major improvements in missile defenses, and the easing of Cold War rivalries—enable us to fulfill those objectives at significantly lower nuclear force levels and with reduced reliance on nuclear weapons”?

a. So how do the Budget Control Act and Sequestration change this calculus? Combined, we are spending \$1 trillion less over a decade on procurement, acquisition, operations and maintenance. For example, we can't sortie or refuel aircraft carriers under the President's sequester. Doesn't this mean, if the logic of the NPR holds true, that, the assumption we can rely on our conventional capabilities and conventional deterrent, should be reconsidered?

Dr. BLAIR. The defense budget cuts under the sequester affect both nuclear and conventional forces to a degree that is difficult to gauge at this time. If U.S. conventional capabilities erode significantly as a result, then U.S. reliance on nuclear options could well grow somewhat. The major determinant of this reliance, however, will likely be the international security environment and U.S. security relations with Russia and China. If these relations continue to improve, leading for instance to stronger regional security and peace in Asia, then the United States will require less conventional and nuclear capabilities.

QUESTIONS SUBMITTED BY MR. COOPER

Mr. COOPER. 53) Have improvements to yield or accuracy in reaching targets changed the targeting requirements and/or reduced the number of nuclear weapons required?

Dr. PAYNE. I cannot comment on U.S. plans for nuclear targeting. It is however, a mistake to believe that weapon requirements to meet targeting plans are the same as the requirements necessary for deterrence. U.S. targeting plans and the weapons required to support those plans can be revised by the appropriate U.S. process. But, deterrence requirements are determined by the opponent's calculations and the composition of the opponent's most highly valued assets. The number, lethality and diversity of U.S. weapons necessary to threaten those assets set the requirements for deterrence. These requirements may or may not be reflected in U.S. targeting plans. For deterrence purposes, U.S. targeting plans must be determined by the composition of opponents' most highly valued assets and the forces necessary to hold them at risk, not the number of weapons preferred by the political leadership for other purposes.

Mr. COOPER. 54) How can we reduce the risk of miscalculation in a crisis?

Dr. PAYNE. We can reduce the risk of miscalculation in a crisis by having, prior to a crisis, the most realistic, clear-eyed understanding possible of the opponent and context and multiple channels of communication with the opponent. In the midst of a crisis, reliable communication and mutual understanding between contending parties is unlikely, but may be aided by a solid foundation of long-standing mutual understanding and communication prior to the crisis. Achieving such a level of understanding and communication demands a long-term, multidisciplinary intelligence and diplomatic undertaking vis-à-vis each prospective antagonist. In addition, strategic defenses may help to protect against miscalculation and the possible failure of deterrence by providing a defensive response to apparent threats rather than offensive actions. The role of U.S. missile defense in the context of recent North Korean nuclear missile launches and threats is an example of this benefit.

Mr. COOPER. 55) What are the risks and benefits of having ICBMs on high-alert?

Dr. PAYNE. The benefits of having ICBMs on high-alert include giving the President as much time as possible to assess an evolving crisis and to use that time prudently before making a decision in a high stress situation. In addition, no potentially provocative and time-consuming re-alerting steps are required that an adversary might observe and take as a sign of an imminent attack by the United States. Keeping the ICBM force on high alert, which is relatively inexpensive, avoids the

need to increase force readiness during a crisis and the danger that a de-alerted force could tempt an enemy's first strike strategy by presenting a target set that is easier to strike than would otherwise be the case. Also, the current number of ICBM silos and alert rate may help afford the option of launch under attack rather than a launch on warning strategy, which I consider to be dangerous. In general, alert ICBMs are "stabilizing."

In addition, an alert ICBM force contributes to the assurance of allies, while a de-alerted force would be a source of allied concern. This concern is understandable: allies, who rely on the U.S. extended nuclear deterrence for their protection against nuclear or biological attack are unlikely to find great assurance in a U.S. deterrent threat that is unable to respond to a horrific attack for 72 or more hours. Telling U.S. allies under nuclear or other WMD attack that they would need to wait three days for the U.S. deterrent is unlikely to inspire allied confidence in the U.S. nuclear umbrella. This situation would likely encourage some allies to seek their own independent deterrent capabilities.

As to the risk, reported safeguards in the command and control for ICBMs—the use of authorization codes, the two-person rule, and dual phenomenology for tactical attack warning, for example—reduce the risk of unauthorized or accidental missile launches. I agree with former USSTRATCOM Commander, Adm. Richard Mies on this issue. In the spring of 2012, he wrote "... the oft-cited characterization that our strategic forces are on 'hair trigger' alert is a scare tactic routinely used to justify proposals to lessen the potential responsiveness of our strategic forces. In fact, multiple stringent procedural and technical safeguards are in place to guard against accidental or unauthorized launch and to ensure the highest levels of nuclear weapon safety, security, reliability, and command and control." (ref: Undersea Warfare, Spring 2012, p. 17)

Mr. COOPER. 56) What kind of nuclear force structure do you believe we should have today, if we could choose the ideal force structure today, rather than relying on legacy force structure?

Dr. PAYNE. To support U.S. deterrence and extended deterrence purposes, the U.S. nuclear force structure should be survivable, flexible, diverse and resilient, and thus adaptable to a wide spectrum of prospective deterrence contexts and requirements. As such, it should enable the President to adjust U.S. declared deterrence threats to the specific types and numbers of targets demanded by a diverse and shifting line up of opponents and contexts. It also should provide the President with numerous types of limited threat options to help minimize any prospective use of force should deterrence fail initially. A great advantage of the traditional U.S. nuclear triad is that it helps to provide this type of survivable, flexible and diverse force structure, as can multiple warhead types capable of holding at risk a wide spectrum of prospective targets. The force structure also should be highly survivable to help preclude any opponent from seeing possible advantage in striking at U.S. deterrent forces.

The U.S. strategic force structure also should include active and passive defensive capabilities to help reduce U.S. casualties and limit damage in the event deterrence fails.

To support U.S. assurance goals, the force structure should possess the lethality, quantity, and qualities that provide assurance to key allies. Some allies have identified these characteristics from their unique perspective, including:

- An arsenal that is at least capable in size and scope to Russia's strategic and tactical nuclear arsenal;
- Nuclear forces that are deployed permanently to their region or on their territory;
- Nuclear forces that are rapidly deployable to their region;
- Forces that can be deployed discreetly or with great visibility, as best fits the deterrence occasion; and,
- Warhead designs that include very low-yield and earth-penetrating options.

Finally, U.S. forces should be well-protected and under positive and enduring political control to help ensure no theft or unauthorized use. Similarly, it should help provide the President with the maximum amount of decision time possible to help preclude any pressure toward a rush to employment.

Mr. COOPER. 57) Has Russia reciprocated in the past when the United States has pursued "unilateral" reductions? What are the risks and benefits of the Presidential Nuclear Initiatives (PNIs) as a way to pursue reciprocal reductions?

Dr. PAYNE. The Obama administration recently unilaterally eliminated U.S. TLAM-N (nuclear-armed cruise missiles) systems, despite concerns expressed by a key ally, without any apparent reciprocation by Russia. Russia committed to the 1990–1991 PNIs. These include specific restrictions on tactical nuclear weapons.

However, Russia, according to its own official statements, is in violation of its PNI commitments.

The primary risk of such attempted reciprocal reductions is that the U.S. will consider such reductions to be prudent on the mistaken presumption that Russia would agree to them and abide by its commitment. Russia may agree to reciprocal reductions, but not abide by that commitment. This is the result already seen with the earlier PNIs.

Mr. COOPER. 58) What are your thoughts on more cost-effective alternatives for U.S. nuclear deterrence that could assure our allies of the U.S. strong commitment to nuclear umbrella, given the \$8–10 billion cost for the life extension program of the B–61 nuclear bomb? Is there value in opening a dialogue with NATO countries on potential cost-effective measures for ensuring strong and reliable extended deterrence?

Dr. PAYNE. There certainly is value in continuing dialogue within the NATO alliance regarding the requirements for deterrence and assurance. The recent consensus NATO document on the subject publicly endorsed continuation of the dual capable aircraft (DCA)/B–61 posture and committed the alliance to consensus decisions on this matter. It certainly is reasonable to demand that the B–61 LEP cost be reduced to the extent feasible. However, given the established alliance infrastructure for this system, and its general acceptance with the alliance, I do not know of any plausible alternative posture that would obviously be less costly and also meet alliance-wide deterrence and assurance requirements. Identifying alternatives to the DCA/B–61 posture is not a challenge. But identifying alternative postures that could satisfy NATO deterrence and assurance requirements, and do so more cost-effectively, is the material question.

Mr. COOPER. 59) Dr. Payne: You noted in your disclosure form that you were appearing in an individual capacity and thus did not provide any information on Federal grant contracts (the other witnesses provided this information with Dr. Krepinevich listing his organization's grant contracts, and Dr. Blair noting he did not receive any). Please list the Federal grant contract information sought on the disclosure form (Federal grants for FY2011–2013 and Federal contract information, including number of contracts with the Federal Government, Federal agencies with which the contracts are held, list of subjects of the contracts, and aggregate dollar value of these contracts), relating to the National Institute for Policy and Public Policy (of which you serve as President and co-founder).

Dr. PAYNE. As noted in the question, I appeared in an individual capacity. Indeed, in my opening remarks I stated specifically that the views I presented were my own and not those of any institution with which I am affiliated. As such, I will reply as did Dr. Blair and report that I have no Federal grants or contracts and had none in FY 2011 or FY 2012.

Mr. COOPER. 60) Have improvements to yield or accuracy in reaching targets changed the targeting requirements and/or reduced the number of nuclear weapons required?

Dr. KREPINEVICH. The answer to this question depends on classified information—in particular information on our existing nuclear capabilities and targeting strategies, as well as the capabilities and strategies of potential adversaries. What can be said, however, is that advances in accuracy generally contribute to increased counterforce capabilities, or the ability to target enemy military forces and infrastructure. Nevertheless, improved accuracy can be offset in several ways by a determined adversary; for instance by increasing the mobility of potential targets, hardening potential targets, or fielding “active” defenses such as counter-air and anti-ballistic missile systems. In short, improved accuracy can have an important but not necessarily an enduring effect on force structure requirements and strategy. There will always be a dynamic competition under way between the U.S.'s ability to hold at risk targets that an opponent values and efforts by opponents to better defend those targets from attack.

Mr. COOPER. 61) How can we reduce the risk of miscalculation in a crisis?

Dr. KREPINEVICH. In general, the likelihood of miscalculation during a crisis is influenced by several factors: first, how accurately a nation understands its rival's decision calculus, namely how that rival calculates cost, benefit, and risk; second, the ability to communicate threats, demands, and promises clearly; and third, the nation's “track record,” or its reputation for upholding its past commitments. To the extent that the United States can reduce the risks of miscalculation, therefore, it should make a dedicated effort to better understand potential opponents, take steps to ensure that clear lines of communication are available even during periods of heightened tension; and make good on its threats to take action when an adversary crosses its “red lines.”

Mr. COOPER. 62) What are the risks and benefits of having ICBMs on high-alert?

Dr. KREPINEVICH. According to open-sources, the United States maintains the overwhelming majority of its ICBMs on high-alert status, meaning they can be launched almost immediately after (or upon unambiguous warning of) an attack. Traditionally, the prompt response capability of the ICBM force has contributed to deterrence by providing added certainty that an aggressor would suffer an immediate and devastating retaliation. Today, however, the prospect of a massive "bolt from the blue" attack appears remote, which has led some to argue that ICBMs should be "de-alerted." Proponents of changing the alert status of the ICBM force also maintain that the dangers of unauthorized use and miscalculation are far too high; namely, missiles might be launched absent orders from the national command authority (NCA), or the NCA might be compelled to launch an immediate reprisal in response to ambiguous indicators and warnings, respectively. There are, however, several reasons to be skeptical about the virtues of de-alerting. First, multiple procedures are in place to guard against unauthorized use. Most importantly, launching ICBMs requires authenticating launch codes that can only be authorized by the NCA. Second, the miscalculation argument essentially suggests that because the United States can launch its ICBMs in a matter of minutes, it might do so. It is far more likely, however, that the United States would adopt a retaliatory (rather than launch on warning) posture, except in response to a massive and unambiguous nuclear attack. In sum, de-alerting ICBMs would likely have a minimal impact on strategic stability, and could have a negative impact on deterrence.

Mr. COOPER. 63) What kind of nuclear force structure do you believe we should have today, if we could choose the ideal force structure today, rather than relying on legacy force structure?

Dr. KREPINEVICH. Despite the fact that today's nuclear force structure is a legacy of the Cold War, in many ways it remains well suited to meeting current and prospective security challenges. In particular, even if it were possible to design a new force structure from scratch, the triad of strategic delivery systems that has underpinned nuclear deterrence for half a century is still highly relevant given the unique attributes of each leg. The ballistic missile submarine (SSBN) fleet, for example, provides an extremely survivable and responsive retaliatory capability; the bomber force offers a high degree of visibility and flexibility; and the ICBM force creates a targeting problem for any potential opponents contemplating a first strike, because they would have to expend a large number of nuclear weapons to neutralize a relatively small portion of the U.S. nuclear arsenal. To the extent that planned modernization initiatives proceed, therefore (most importantly fielding a new long-range bomber, developing a successor to the *Ohio* class SSBN, and continuing life-extension programs to maintain the viability of the Minuteman III ICBM), the United States can retain a highly capable nuclear arsenal well into the future.

Mr. COOPER. 64) Has Russia reciprocated in the past when the United States has pursued "unilateral" reductions? What are the risks and benefits of the Presidential Nuclear Initiatives (PNIs) as a way to pursue reciprocal reductions?

Dr. KREPINEVICH. The unilateral nuclear reductions announced by President George H.W. Bush in 1991, aimed at reducing the U.S. arsenal of forward-deployed tactical nuclear weapons, symbolized the dramatic change that had taken place in U.S.-Soviet relations at the end of the Cold War. Although Mikhail Gorbachev (and subsequently Boris Yeltsin) pledged to respond in kind, there are reports that Moscow has not upheld its commitment to destroy certain classes of tactical nuclear warheads. To what extent, then, might these unilateral initiatives provide a basis for reciprocal U.S. and Russian nuclear reductions in the future? In general, two observations are worth making. First, there is an inherent dilemma in unilateral reductions of any kind. On the one hand, small, symbolic reductions intended to demonstrate good faith and encourage reciprocity are rarely meaningful in a military sense, and therefore may not lead others to follow suit. On the other hand, the large, meaningful reductions that might be necessary to encourage reciprocity can be quite dangerous if others choose not to respond in kind. This dilemma makes the notion of unilateral, reciprocal reductions a difficult model for informal arms control. Second, unilateral reductions—particularly unilateral reductions in tactical nuclear weapons that do not have large signatures—can be difficult to monitor and verify, because they lack the enforcement provisions contained in formal arms control agreements.

Mr. COOPER. 65) How can further nuclear weapons reductions beyond New START strengthen national and security?

Dr. KREPINEVICH. Perhaps the only way that further nuclear reductions beyond the levels outlined in New START would unambiguously strengthen U.S. national security is if they were multilateral in scope (i.e., if all existing and prospective nuclear powers participated), made in such a way as to preserve the United States'

existing quantitative and qualitative advantages relative to other nuclear powers (e.g., through proportional reductions), and rigorously verifiable. Beyond this extremely unlikely set of conditions, any future reductions are likely to be so small that their impact on U.S. national security (for better or worse) would be marginal, or so large that they would raise legitimate concerns that U.S. national security would be harmed more than helped.

Mr. COOPER. 66) What are your thoughts on more cost-effective alternatives for U.S. nuclear deterrence that could assure our allies of the U.S. strong commitment to nuclear umbrella, given the \$8–10 billion cost for the life extension program of the B–61 nuclear bomb? Is there value in opening a dialogue with NATO countries on potential cost-effective measures for ensuring strong and reliable extended deterrence?

Dr. KREPINEVICH. Although the cost of the B–61 life extension program is substantial, it is important to note that the purpose of this effort is not solely to preserve our nuclear guarantees to NATO partners. Specifically, this program seeks to modernize tactical nuclear weapons delivered by dual-capable combat aircraft (which underpin extended nuclear deterrence in Europe) and strategic nuclear weapons delivered by dual-capable bombers.

Mr. COOPER. 67) Have improvements to yield or accuracy in reaching targets changed the targeting requirements and/or reduced the number of nuclear weapons required?

Dr. BLAIR. Improvements in the accuracy of U.S. nuclear weapons have increased their lethality and enabled U.S. planners to decrease the yield of the weapons and the number of weapons aimed at the same target. However, the dominant factor today in reducing the number of U.S. warheads required to cover the target set—apart from the steady reduction in the size of the Russian nuclear arsenal, which shrinks the target set—is the revolutionary improvement in surveillance and intelligence collection. For instance, better intelligence on the target set such as on the entryways to hardened command bunkers has reduced the number of aimpoints and reduced the number of U.S. weapons assigned to strike such targets. Similarly, to the extent that the location of mobile missiles in the field (out of garrison) in Russia and China can be pinpointed through real-time surveillance, then the fewer weapons required to barrage the area to offset the ‘position location uncertainty’ of the mobile targets.

One of the other main factors today in setting requirements and allocating warheads is the reliability of the U.S. strategic missile force. For instance, U.S. planners are generally forced to assign two warheads to attack each opposing nuclear missile silo in order to ensure that one of them arrives on target if the other one proves unreliable.

Mr. COOPER. 68) How can we reduce the risk of miscalculation in a crisis?

Dr. BLAIR. The best way to reduce the risk of miscalculation in a crisis is to improve warning and intelligence, and above all to increase the amount of warning and decision time. Under the current U.S. nuclear posture, which depends on launch on warning in the event of a large-scale Russian attack, the time allowed for information processing and decisionmaking from the top to the bottom of the chain of nuclear command would be measured in minutes and seconds. Emergency war order (EWO) decisionmaking and execution are driven by checklists and such short deadlines that the process is aptly characterized as the enactment of a prepared script. The risks of premature intentional launch, launch on false warning, mistaken launch based on erroneous intelligence and warning, and unauthorized launch remain very real today.

The Global Zero report chaired by Gen. (ret.) Cartwright and co-authored by then-Senator Hagel addressed this issue by recommending that U.S. and Russian missiles be taken off of launch-ready alert. De-alerting steps would be adopted that require 24–72 hours to reverse. The amount of warning and decision time would thus be increased from minutes to days.

Mr. COOPER. 69) What are the risks and benefits of having ICBMs on high-alert?

Dr. BLAIR. The risks of having ICBMs on high-alert are numerous. First, they create ‘use or lose’ pressures on the national command authorities on both sides because neither U.S. nor Russian missiles (in silos, in garrison garages, or hiding in the field in the case of dispersed mobile ICBMs) could survive an attack by the opposing side unless they are launched on warning of incoming warheads minutes before the warheads arrive. The pressures exerted on the President and the rest of the chain of command would be severe and would increase the risks of an inadvertent nuclear exchange. In projecting a crippling first strike threat at each other, these forces inject instability into a crisis.

ICBM launch circuits may also be vulnerable to cyber warfare. ICBMs on high alert are ready to fire in seconds and only need to receive a short stream of computer signals to cock their warheads, ignite their rocket motors, and blast out of their silos. Keeping them on hair-trigger alert in an era of sophisticated cyber warfare invites catastrophe. The Russian rockets are also kept at instant launch readiness. At a recent Senate hearing, the current head of Strategic Command was asked whether cyber hackers could trigger a Russian rocket launch, whose aimpoint might be New York City. His answer: I don't know. With the help of insiders in possession of passwords and other codes, it is likely that the firewalls sealing off the launch circuits of both countries' nuclear missiles could be breached.

ICBMs and their launch centers and crews are themselves sitting targets for terrorists or others to attack or infiltrate. Launch crews routinely ignore a cardinal nuclear safety and security rule: the multiton blast door protecting the underground center may not be opened by a crew member when the other is sleeping. That rule is fudged when, for instance, a crew member calls topside for a thermos of coffee to stay awake while his or her crewmate snoozes during the 24-hour alert stint.

This transgression might help enable outsiders to gain access to the launch center, and to its super-secret codes, the result of which would be an increase in the risk of unauthorized launch or of compromising critical codes whose wholesale invalidation might become necessary to prevent unauthorized launches. Such invalidation might effectively neutralize for an extended period of time the entire U.S. strategic nuclear arsenal and the President's ability to launch strategic forces while the Pentagon scrambles to reissue new codes.

As for the benefits of keeping ICBMs on high-alert, one may be their responsiveness and potential ability to be fired so quickly that an adversary could not be confident in delivering a knock-out punch to the opponent's ICBM force. However, as noted above, the flip side of the 'benefit' are the liabilities associated with having to fire these forces quickly by necessity lest incoming warheads destroy them on the ground. All these scenarios apply to a U.S.-Russian exchange only, which is the least plausible scenario today. U.S. ICBMs would have to fly over Russia to reach targets in other countries—China, Iran, North Korea. These polar routes are to be avoided. Thus the ICBMs high launch readiness offers scant benefit in confrontations with any other country besides Russia.

Mr. COOPER. 70) Dr. Blair: You noted in your testimony the discovery in the 1990s of an electronic back door to the Naval Broadcast network that could have been exploited by outside hackers to inject a launch order into the VLF (Very Low Frequency) radio network used to transmit launch directives from the Pentagon to Trident ballistic missile submarines on launch patrol. How was this discovered and what is the risk and consequence of adversaries finding and using a vulnerability of the command and control system?

Dr. BLAIR. The discovery of an electronic back door to the Trident force was discovered during an intensive investigation in the mid-1990s by a nuclear fail-safe commission headed by the late Amb. Jeanne Kirkpatrick. Dozens of deficiencies that increased the risk of unauthorized use of nuclear weapons were discovered by this commission, leading to significant strengthening of safeguards—e.g. new locks installed on Trident launching components, and new protocols for Trident crews to authenticate launch orders.

The risks and consequences of adversaries exploiting deficiencies in nuclear command and control systems essentially boil down to two general dangers. First, an unauthorized actor—a state or even a group or individual—could inject false missile attack warning information or a launch order itself into the communications network and trick commanders into ordering or carrying out a launch. Second, the penetration of the nuclear command control system could compromise the codes used to arm and fire nuclear weapons, and the resulting invalidation of the codes could thwart the ability of the President to command the U.S. nuclear arsenal. Both of these general dangers would be significantly aggravated if a corrupt 'insider' assisted outsiders in breaching the command, control, communications, and early warning networks.

Mr. COOPER. 71) What kind of nuclear force structure do you believe we should have today, if we could choose the ideal force structure today, rather than relying on legacy force structure?

Dr. BLAIR. The Global Zero Nuclear Policy Commission report "Modernizing U.S. Nuclear Strategy, Force Structure, and Posture" (May 2012) outlines a nearly optimal nuclear force structure and posture for the next decade. The force structure would consist of 900 total weapons. It utilizes legacy forces such as Trident SSBNs and B-2 strategic bombers that would contribute to U.S. national security and to strategic stability, and it eliminates legacy forces such as Minuteman ICBMs, B-52 strategic nuclear bombers and tactical nuclear weapons that contribute less. The

commission also recommends diversifying the U.S. deterrent forces to include missile defenses and a conventional ICBM. The ideal force structure would improve upon some of the features of retained legacy forces, but mainly it would provide for much longer warning and decision time, and would greatly reduce the risks of inadvertent launch stemming from today's extremely short warning and decision times. Security and stability in the nuclear arena stem more from strong command and control systems than from the size and technical characteristics of the forces.

Mr. COOPER. 72) Has Russia reciprocated in the past when the United States has pursued "unilateral" reductions? What are the risks and benefits of the Presidential Nuclear Initiatives (PNIs) as a way to pursue reciprocal reductions?

Dr. BLAIR. It is important to remember that the vast majority of nuclear cuts during the nuclear era—75 percent reductions in U.S. and Russian stockpiles since their peak of 70,000 weapons in the mid-1980s—were made unilaterally by both sides. No arms agreements ever regulated the size of their total stockpiles. START agreements have only covered one category of weapon—deployed strategic—which represented a fraction of the total stockpiles. So both countries pursued unilateral stockpile reductions in parallel, without verification provisions for the most part, and this informal reversal of the nuclear arms race should be recognized as having contributed hugely to the vast reductions on both sides.

PNIs were a part of this informal process though they were more specific in the sense that the parties pledged to eliminate and reduce some specific categories of weapons. They contributed to a dramatic reduction in overall stockpile sizes even though some weapons that the Russians pledged to eliminate did apparently remain in their arsenal. This discrepancy has generated accusations of Russian cheating that has spoiled the otherwise positive effects of these parallel reciprocal measures. Without a 'contract' agreement between the parties and verification provisions, PNIs are susceptible to misinterpretation, ambiguous compliance, and political strains.

One of the great benefits of the 1991 PNIs was the speed with which they were informally adopted and carried out. It took months rather than many years to downsize the arsenals under the PNIs. It is important to keep in mind that the main purpose of the 1991 PNIs was to improve the security of Russian nuclear weapons by giving President Gorbachev an excuse to return Russia's far-flung tactical weapons to Russia, and to consolidate them at storage locations that strengthened security over them. The goal was not to slash the size of the arsenals so much as to prevent them from falling into the hands of neighboring states or terrorists.

Mr. COOPER. 73) How can further nuclear weapons reductions beyond New START strengthen national and security?

Dr. BLAIR. Further nuclear arms reductions beyond New START can serve U.S. national security interests in innumerable ways, beginning with the fact that fewer weapons in Russia mean fewer possibilities for inadvertent or unauthorized nuclear strikes against the United States and potentially less damage if such strikes occurred. More importantly, further reductions that draw China and other nuclear weapons states such as Pakistan and India into negotiations to cap, reduce, or otherwise constrain their arsenals would bring stability and regulation to dangerous regions of the world, and help thwart further proliferation and nuclear terrorism. It is critical to bring these other states to the negotiating table. The alternative is further proliferation, growing arsenals, new nuclear arms races, and growing risks of an intentional or unintentional outbreak of nuclear violence. It is manifestly in the U.S. national interest to prevent such outcomes, and multilateral cooperation involving all the nuclear weapons states including those outside of the NPT (Pakistan, India, and Israel) in constraining nuclear arms is critical to preventing a nuclear catastrophe that deeply undermines U.S. and international security.

Mr. COOPER. 74) What are your thoughts on more cost-effective alternatives for U.S. nuclear deterrence that could assure our allies of the U.S. strong commitment to nuclear umbrella, given the \$8–10 billion cost for the life extension program of the B-61 nuclear bomb? Is there value in opening a dialogue with NATO countries on potential cost-effective measures for ensuring strong and reliable extended deterrence?

Dr. BLAIR. I doubt whether America's allies' perception of the U.S. commitment to their defense depends at all on the status of the B-61 life extension program. Our NATO allies have the guarantee of NATO-wide protection led by the United States and her overwhelming conventional superiority backed up by a strategic nuclear capability capable of deterring any rational leader. Reallocating the \$10 billion earmarked for B-61 LEP to shoring up U.S.–NATO conventional capabilities during

a time of defense budget austerity might do more to reassure the allies. This is an important topic for dialogue with America's allies.

